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Prehistoric America

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1893



PRE-HISTORIC AMERICA

BY THE

MARQUIS DE NADAILLAC, *Jean François*
Acad. des Beaux-Arts

TRANSLATED BY N. D'ANVERS

• EDITED BY W. H. DALL



WITH 219 ILLUSTRATIONS

G. P. PUTNAM'S SONS

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NOTE BY THE AMERICAN EDITOR.

The present translation of the Marquis de Nadaillac's *l'Amerique Préhistorique*, published by Masson in 1882, was made with the author's sanction. By his permission it has been modified and revised to bring it into harmony with the results of recent investigation and the conclusions of the best authorities on the archæology of the United States.

It is proper to state that this has required a revision of the chapters relating to the archæology of North America and the addition to them of much new material. For such changes and additions the American editor is to be held responsible.

Many quotations have been verified by Mr. J. W. Gibbs, and the acknowledgments of the translator are also due for assistance rendered in architectural matters by Prof. T. Roger Smith of London University, and in other details by Dr. Sainsbury and Miss F. E. Judge.

To the courtesy of the Messrs. Harper & Bros., the publishers are indebted for the opportunity of using a number of illustrations relating to the archæology of Peru. These originally appeared in Squier's well-known work on Peru, which has been cited as an authority on numerous occasions by the author of the present work.

PREFACE.

Pre-historic man has for some time excited a justifiable interest not only among men of science but among men of intelligence everywhere.

The first revelations in regard to the co-existence of man with extinct animals were received not only with surprise but with natural incredulity. Soon, however, proofs of such weight multiplied, that doubt became no longer reasonable, and we are now able to assert with confidence that, at a period from which we are separated by many centuries, man inhabited the earth, already old at the time of his appearance. The length of this period can be measured by no chronology, no calculation can compute it, history and tradition are silent with regard to it; and it is only by the study of works which may be almost termed stupendous, and by the most careful reasoning that traces of pre-historic man have been followed up through an almost fabulous past and some idea has been gained of the rude pioneers who were the ancestors of the human race. With some probability Asia has been fixed upon as the primæval cradle of humanity, from which by successive migrations, during an incalculable period, man spread to the uttermost parts of the Old World.

At an epoch not far distant, men probably derived from the same source, made their appearance in the New World, wandering on the shores of either ocean. Like their nomad contemporaries of the other hemisphere they knew no shelter save that afforded by nature in her forests and rocks. Rudely shaped stones served them alike for tools and weapons and their social condition was paralleled by that known for their European contemporaries under the name of the *Stone age*. In accordance with a universal law of

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Nature now well recognized, men alike in habits, physique, and mental culture, though in the midst of most diverse conditions of fauna, flora, and climate, were traversing the forests of India and the frigid regions of the north, chasing the reindeer or the bear on the banks of the Delaware or the Mississippi as well as along the Thames or the Seine.

Nor is this all; the inhabitants of distant continents passed through strictly analogous phases of culture. The nomads were succeeded by sedentary tribes who settled by the banks of rivers or the shores of ocean, wherever the bounty of the waters afforded the subsistence. Shell-heaps and kitchen middens bear witness to the long duration of their sojourn. Centuries passed, new wants were felt, æsthetic feeling awoke, and here and there the stimulus to progress did not fail. Social life had taken on a communal garb and the common needs led to united effort for their satisfaction. Mounds, tumuli, pyramids, arose, and earthen structures in whose form the savage often embodied the animal outlines associated with his myths or ceremonials. In other regions, probably later, another form was taken by the outward symbols of social structure, resulting in beehive-like pueblos. Threatened by dangers soon to be ever present they sought for refuge in the recesses of the cliffs, conquering difficulties of construction which appear almost insurmountable to our eyes. Towns and monuments arose of which the imposing ruins still bear witness to the skill of those whose very existence has been but recently made known.

Although mounds and cliff-houses, ruins and temples, determine no dates of erection or names of the builders, yet through them we may become acquainted with the essentials of the manners, habits, and mental culture, of the ancient inhabitants of America. We are able to conclude that at the time of the first European invasion the civilization of the Americans, the slow growth of ages, was in some respects not inferior to that of their conquerors.

In "*Les premiers hommes et les temps préhistoriques*," I have

described the Stone Age of Europe and the early resting-places of the ancient inhabitants of the Old World. The good-will with which that work was received has led me to supplement it by tracing the analogous period in America, seeking the first evidences of a culture parallel to our own and bringing the recital down to the sixteenth century of our era.

My task has been facilitated by the numerous investigations undertaken in the United States. There, many societies devote themselves to the study of aboriginal antiquities, museums exist already containing a wealth of material; excavations are carried on with an energy and perseverance justly commanding admiration. Success has crowned these efforts, every day bringing to light the most remarkable discoveries, the most unexpected results.

These researches and discoveries it is my desire to make widely known, but, as I have said elsewhere, and now repeat, the state of archæology is such that however great the importance of the facts revealed by it, we cannot regard our present conclusions from them as final. Nothing has been more injurious to science than the ephemeral popularity of hypotheses which the revelations of a day have sometimes overturned. As was lately said by Virchow, "when we know as little as we do yet, it behooves us to be modest in our theories."

Our present lack of information, however, is stimulating rather than prejudicial to archæological study. For my part I know no grander spectacle than the onward march of human progress. Every fact won, every stage accomplished, becomes the starting point of fresh acquirement, of further progress which will ever be the glorious heritage of future generations. A yet more elevating sentiment results from these studies which is a profound gratitude toward Him who created man, who made him capable of such progress and granted him such potentiality of mind. Science in its freedom and its strength cannot disown its author.

PARIS, October 7, 1882.

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CHAPTER I.

MAN AND THE MASTODON.

THE existence of the American continent was unknown to the Egyptians and the Phœnicians, as well as to the Greeks and Romans. We find nothing in the writings either of historians or of geographers to justify the assertion that the ancients even suspected the existence of a vast continent beyond the Atlantic, and a few vague statements, a few bold guesses, interpreted later with the help of accomplished facts, cannot be accepted as evidence. M. De Guignes has endeavored to prove that intercourse took place between China and America as early as the fifth century of our era¹; according to legends in which a little truth is mingled with much fiction, Northmen landed in New England about A.D. 1000; and in maps dating from the fourteenth and fifteenth centuries, continents and islands of uncertain outline are for the first time represented beyond the ocean. The Eskimo passed freely from one continent to another in the circumpolar regions, but they were themselves as entirely unknown as the other inhabitants of America. In the course of the present work we shall examine into the question of the relations which may have existed between the Old World and the New, but shall content ourselves at present with saying that the first positive information about the new countries and their mysterious people dates only from the fifteenth century. Side by side with the glorious name of Christopher Columbus,² we must place those of Jacques Car-

¹ These fables arose from early voyages of the Chinese to Korea and Japan, exaggerated accounts of which were misunderstood by students of ancient Chinese literature.

² Christopher Columbus left Palos, near Seville, on the 3d of August, 1492, and on the 14th of the following October landed on the island of Samana.

tier, John and Sebastian Cabot, Amerigo Vespucci, Magellan, Pizarro, and especially Fernando Cortes, as the first to establish the supremacy of European civilization in the New World.

Cortes disembarked at the mouth of the little river Tabasco, on the shore of the Gulf of Mexico, and fought two successive battles with the Indians,¹ who ventured to oppose his passage. The second battle, which was bloody and long contested, took place on the 18th of March, 1519. Victory remained with the Spaniards, and Cortes erected upon the soil of America his great standard of black velvet embroidered with gold, having in the centre a red cross surrounded by blue and white flames, bearing the following inscription in Latin: "Friends, let us follow the Cross, and if we have faith in that sign we shall conquer." This was Europe's Act of Appropriation; from that moment her fortunes and those of the New World have been indissolubly united.²

¹Columbus, imbued with the ideas of his time, supposed the land he saw stretching before him to be the coast of India, hence the name of the West Indies, and that of Indians still given to the natives of America, as if posterity had felt it a point of honor to perpetuate the illusion of the great navigator.

²Pre-historic America has been discussed by numerous writers. A mere list of them would fill a long bibliography: we will only name: Atwater's "Description of the Antiquities of Ohio"; the publications of the Smithsonian Institution, including the work of Squier and Davis on "Ancient Monuments of the Mississippi Valley"; the researches of Dr. Chas. Rau, and those of Dall, on pre-historic remains in the Aleutian islands; Squier's "Antiquities of the State of New York," and Lapham's "Antiquities of Wisconsin"; Schoolcraft's "Historical and Statistical Information Respecting the Indian Tribes of the United States," in six volumes; Baldwin's "Ancient America"; Wilson's "Pre-historic Man"; Waldeck's "Voyage au Yucatan"; Charnay's "Cités et Ruines Américaines," with a preface by Viollet le Duc; Stephens' "Incidents of Travels in Central America," in two volumes; Prescott's "Conquest of Mexico" and "Conquest of Peru"; Jones' "Antiquities of the Southern Indians"; Morton's "Crania Americana"; Nott and Gliddon's "Types of Mankind"; Foster's "Pre-historic Races of the United States"; Brasseur de Bourbourg's "Histoire des Nations Civilisées du Mexique et de l'Amérique Centrale," in four volumes; Southall's "Recent Origin of Man"; Short's "North Americans of Antiquity"; Tylor's "Researches into the Early History of Mankind"; Squier's "Peru"; his "Incidents of Travel and Exploration in the Land of the Incas"; and the important work of H. H. Bancroft, on "The Native Races of the Pacific States of North America," in five volumes.

In the sixteenth century America was inhabited from the Arctic Ocean to Cape Horn, from the shores of the Atlantic to those of the Pacific, by millions of men of types analogous to and with characteristics as varied as many of the inhabitants of the Old World. Amongst them were to be found numerous shades of complexion, from the ruddy white of the inhabitants of the Cordillera of the Andes, of the Amazon valley, or of the island of Santa Catherina, to the much darker tint of some of the tribes of California and Florida, of the natives of the island of St. Vincent, or of the Charruas dwelling on the southern banks of the Rio de la Plata.¹ The Eskimo of the north were short; the Patagonians of the south were remarkable for their lofty stature.² Some Indian tribes had slender limbs with small hands and feet; others were robust and stoutly built. Some had round heads, whilst in others the dolicho-cephalous³ form was pronounced. Some had an abundant crop of hair, others scarcely any; some shaved their heads, others let their hair grow long. It would take a long time to enumerate all the differences of type and race met with by Europeans when they first arrived on the American continent. The native Americans lived among mammalia, birds, fish, and reptiles mostly unknown in Europe. In the south the Llama⁴ was their chief domestic animal; they used it as a beast of burden, ate its flesh, clothed themselves with its wool. Oxen, camels, goats, horses, and asses were unknown to them. The European dog, our faithful companion, also appears to have been a stranger to them.⁵ His place was very inadequately filled

¹ Nott and Gliddon's "Types of Mankind"; Broca, Pruner Bey, *Bull. Soc. Anth.*, 1862; Ameghino, "La Antigüedad del Hombre en el Plata," vol. i., p. 71.

² Topinard, *Rev. d' Anth.*, 1878, p. 511.

³ From *δολιχος* long, and *κεφαλη* head.

⁴ The Llama (*Auchenia*) is a ruminant of the family of the *Camelidæ*. It resembles the camel in the peculiar structure of its stomach, and is a native of the regions on the slopes of the Cordillera of the Andes. The Guanaco and the Vicuña are species of the same group.

⁵ Certain kinds of dogs were, however, domesticated in America. They were called *Xulos* in Nicaragua, *Tzomes* in Yucatan, and *Techichis* in Mexico.

by the coyote,¹ or prairie wolf, which they kept in captivity and had succeeded in taming to a certain extent. The large feline animals were represented by the jaguar,² the lynx,³ the puma,⁴ the habitat of which extended from Canada to Patagonia; and the ocelot,⁵ frequenting Mexico and part of South America. The bears were represented by the little black bear⁶ and by the grizzly bear,⁷ both of which differ in many important characters from any which could have been previously known to the Spaniards. Even the monkeys, so numerous in South America, were quite unlike those of the Old World. All had long prehensile tails, such as are not possessed by European or African monkeys.

The differences in the flora were not less marked. The trees were generally of species foreign to Europe and Asia. Maize was the only cereal cultivated in the New World, though the so-called "wild rice" was harvested in North America. Wheat, rye, barley, oats, millet, and rice were unknown to the Indians. On the other hand, they had a leguminous plant, the manioc, different from any European vegetable,⁸ tobacco,⁹ tomatoes, and peppers—all valuable acquisitions to civilization.

These were considered to afford very delicate food after having been castrated and fattened.

¹ *Canis latrans*, Baird. In a description of Virginia published in 1649, we read: "The wolf of Carolina is the dog of the woods. The Indians had no other curs before the Christians came amongst them. They are made domestic. They go in great droves in the night to hunt deer, which they do as well as the best pack of hounds."

² *Felis onca*, Linnæus, a native of South America.

³ *Lynx canadensis*, Raf., known also under the name of loup-cervier or wild-cat; its skin formed one of the objects of trade by the Hudson Bay Company. The natives are said to eat its flesh, which is white and insipid.

⁴ *Felis concolor*, Illiger,

⁵ *Felis pardalis*, Linnæus.

⁶ *Ursus Americanus*, native to North America.

⁷ *Ursus ferox*. It could easily drag off a buffalo weighing more than a thousand pounds. Some twenty years ago this bear was still pretty common in California. The Indians hunted and overcame it with the help of their lassos.

⁸ The roots of the manioc yield a starch known under the name of tapioca.

⁹ It is said that tobacco was first imported into Europe in 1588 by Sir Walter Raleigh.

The Indians, who were successively conquered by foreign invaders, spoke hundreds of different dialects. Bancroft estimates that there were six hundred between Alaska and Panama;¹ Ameghino² speaks of eight hundred in South America. Most of these, however, are mere derivatives from a single mother tongue like the Aymara and the Guarani. We quote these figures for what they are worth. Philology has no precise definition of what constitutes a language, and any one can add to or deduct from the numbers given according to the point of view from which he considers the matter. As an illustration of this, it may be mentioned that some philologists estimate the languages of North America at no less than thirteen hundred, whilst Squier³ would reduce those of both continents to four hundred,

These dialects present a complete disparity in their vocabulary side by side with great similarity of structure.⁴ "In

¹ "Native Races," vol. III., p. 557. These dialects may be divided into numerous distinct groups, of which four particularly characteristic families may be mentioned. 1. The Innuít or Eskimo, which differs strongly from the other American languages; 2. The Tinné, spoken in the Rocky Mountain region, and extending into Alaska, the British possessions, Oregon, California, New Mexico, and Texas; 3. The Aztec or Nahuá, which is widely spread throughout Central America. The remarkable poems of Nezahualcoyotl, king of Tezcuco, are written in this language. Lastly the Maya-Quiché, probably the most ancient language of Central America, which predominated in Yucatan, Chiapas and Guatemala. The Indians of Yucatan are said to speak it to this day, and Señor Orozco y Berra tells us that all the geographical names of the peninsula are of Maya origin ("Geog. de las Lenguas de Mex.," p. 129).

² "La Antigüedad del Hombre," vol I., p. 77. Señor Ameghino notes the curious fact that amongst certain tribes the women speak a dialect distinct from that of the men. It is more likely that the sexes merely express themselves in a different manner.

³ Nott and Gliddon, "Types of Mankind." Squier asserts that one hundred and eighty-seven words of these four hundred dialects are common to foreign languages; one hundred and four occur in Asiatic or Australian, forty-three in European, and forty in African languages. This, however, requires further confirmation.

⁴ Bancroft, vol. III., p. 556. "Other peculiarities common to all American languages might be mentioned, such as reduplications, or a repetition of the same syllable to express plurals; the use of frequentatives and duals; the application of gender to the third person of the verb; the direct conversion of nouns, substantive and adjective, into verbs, and their conjugation as such;

America," says Humboldt,¹ "from the country of the Esquimaux to the banks of the Orinoco, and thence to the frozen shores of the Straits of Magellan, languages differing entirely in their derivation have, if we may use the expression, the same physiognomy. Striking analogies in grammatical construction have been recognized, not only in the more perfect languages, such as those of the Incas, the Aymara, the Guarani, and the Mexicans, but also in languages which are extremely rude. Dialects, the roots of which do not resemble each other more than the roots of the Sclavonian and Biscayan, show resemblances in structure similar to those which are found between the Sanscrit, the Persian, the Greek, and the Germanic languages." These languages are polysynthetic² and agglutinative,³ which generally indicates a rudimentary state of culture. They were, however, rich enough to indicate that there was not a total absence of intellectual development.⁴ Their diversity may be accounted for by the constant crossing of races, migrations, and by the new customs

peculiar generic distinctions arising from a separation of animate from inanimate beings."

¹ Quoted by Pritchard, "Natural History of Man," 4th edition, vol. II., p. 496.

² Gallatin ("Trans. Am. Ethn. Soc.," vol. I.) defines a polysynthetic language as one in which all that modifies the subject or the action, or still more several complex ideas having a natural connection with each other, is expressed by a single word. The Aztec language is one of the most curious of this kind. Take, for instance, the word *Amatlacuilolquitcatlaxlahuilli*, which means, "Payment received for having been bearer of a paper with writing on it." On p. 34 Gallatin gives the longest word in the Cherokee language—*Winitawtgeginalkawlungtanawnelitisesti*, which translated into English means: "They will by that time have nearly done granting (favours) from a distance to thee and to me."

³ An agglutinative language is one in which new words are formed by joining roots together without changing their construction. Ameghino in his "*Antigüedad del Hombre*," vol. I., p. 76, says: "casi todas las lenguas Americanas son polisilábicas o aglutinativas, es decir que difieren esencialmente del grupo de lenguas monosilábicas del Asia oriental y de las lenguas a flexion que hablan los pueblos arianos."

⁴ We cannot agree with Canon Farrar's opinion, that the richness which has been admired in the aboriginal American languages is only a means of hiding their real poverty ("Families of Speech," London, 1873, pp. 124 *et seq.*).

and ideas which gradually become introduced even amongst the most degraded peoples; still more by the well-recognized instability and mobility of many aboriginal languages. Some missionaries say they have found the language of tribes, revisited after an absence of ten years, completely changed in the interim.¹

The differences in culture of the American aborigines were hardly less remarkable. These need not, however, surprise us, for at the same period equally radical differences existed among European races,—differences, indeed, which are still maintained in spite of constant intercommunication. Some of the American races were rich, industrious, and agricultural; they had an organized government, towns, laws, a religious system, and a powerful priesthood. In reporting to the Emperor Charles V. on a reconnoissance made in the province of Quacalco, Cortes stated that the river² was dotted on either side with numerous large towns. "The whole province is level and well fortified, rich in all the productions of the earth."³ His verdict was equally favorable in many other particulars.

Side by side with these people, who may best be compared with the ancient nations of Asia, dwelt other aborigines, presenting a complete contrast to their neighbors; sedentary tillers of the soil, living in communities, in *pueblos* resembling bee-hives in their arrangement; the Algonquins and the Apaches, nomad savages living on grasses and roots when the chase and fishing failed them; the Aleutians, disfigured by hideous tatooing, chasing the sea otter in ingenious canoes of seal-skin, fabricating delicate tissues out of such materials as grass-fibres and feathers, and deriving their entire subsistence from the products of the sea.

Some of these people venerated animals, such as the serpent and the owl; in Honduras it was the tiger, in Vancouver

¹ Dr. Carl Güttler, "Naturforschung und Bibel," Freiburg im Breisgau, 1877.

² The Coatzacoalcos, a river of the isthmus of Tehuantepec, at the southern extremity of the province of Vera Cruz.

³ Carta Segunda de relacion ap. Lorenzana, Folios 91, 92. Published at Mexico, 1700.

Island the squirrel, which was connected with religious myths. Nor was this the extreme limit of human degradation; among certain Californian tribes men and women wandered about stark naked, recognizing neither laws, Gods, nor chiefs, and owning no shelter but that of some lofty tree, or the cave for which they competed with the wild beasts.

No less striking were the contrasts in South America; side by side with the Peruvians, the richest and most cultured people of the two Americas, the barbarous Querandis occupied the territory now forming the Argentine Republic. On the 2d of February, 1535, Don Pedro de Mendoza landed at the mouth of the Riachuelo, where he founded the city of Santissima Trinidad de Buenos Ayres. One of his companions has written an account of his expedition,¹ and of his long struggle with the savages who had nothing but stone weapons, slings with which they flung their *bolos*, and the lassos so formidable in their hands. Even less civilized were the vast deserts of the extreme South, overrun as they were by savage nomad tribes, disputing with each other and with wild beasts for subsistence and shelter.

Such were the people upon whom the Europeans swept down as upon a prey given over to their desires. While Cortes was subjugating Central America, and Pizarro was overturning the throne of the Incas, parties led by Mendoza, Solis, Gaboto, and Cabeça de Vaca ascended the Rio de la Plata, the Paraguay, and the Parana, their courage and energy winning for Spain the magnificent colonial empire which she retained until the nineteenth century. Why was it necessary that their glory should have been stained by foul cruelty and gloomy fanaticism?

The Portuguese² were no less active, and the two nations

¹ A German soldier, Ulrich Schmidt, who took part in the expedition, has given a very interesting account of it, which was printed at Frankfort-on-the-Main in 1567, under the title of "Warhafftige und liebliche Beschreibunge etlicher furnemen Indianischen Landschafften und Indsulen," etc. See also Ruy Diaz de Guzman's "Historia del descubrimiento, conquistas y poblacion del Rio de la Plata."

² For an account of the part taken by the Portuguese in the discovery of the

disputed for the possession of the New World with ferocious zeal.

On the 9th of March 1500, Alvarez de Cabral left Portugal with a fleet of thirteen vessels, to go to the Indies by way of the Cape of Good Hope. After passing the Cape de Verde islands he steered westward to avoid the calms which prevail off the coast of Guinea. Chance favored him beyond his hopes, and six weeks after he sailed he landed at Porto Seguro. Brazil was thus discovered,¹ and Cabral had the glory of giving to his country a land sixteen times as large² as France. The country was inhabited by the Tupis, of the Guarani race.³ These people lived in villages consisting generally of four spacious green arbors enclosing a square. They were skilful in the use of the bow, and subsisted upon the products of the chase. They were entirely naked. A strange ornament disfigured the men, who wore in the lower lip a plug of wood or jade,⁴ the weight of which dragged down the lip in a hideous fashion.

Some years later, Magellan⁵ discovered the strait bearing his name. An Italian named Antonio Pigafetta, who went with him, relates⁶ that the great navigator was obliged

New World, see a capital essay by L. Cordeiro in the first volume of the *Compte rendu du Congrès des Américanistes*, held at Nancy in 1875.

¹ It is possible that the French had previously touched at several points of Brazil. On this point see Bergeron, "Hist. de la Navigation," Paris, 1630, p. 107. "Normans and Bretons, however, maintain that they were the first to discover these countries, and that they traded from time immemorial with the natives of that part of Brazil now known as Porto Real. But there having been no written record of this intercourse it has fallen into complete oblivion. The Portuguese called the country Santa Cruz, after the cross solemnly erected by Cabral; but our French called it Brazil, because that wood grows very plentifully in certain parts." See also an essay by M. Gaffarel, *Congrès des Américanistes*, Luxembourg, volume I., 1877.

² Brazil has an area of 3,288,000 English square miles.

³ Dr. Conto de Magalhães, "O Selvagem," Rio de Janeiro, 1876. The Guaranis also peopled the Argentine Republic, Uruguay, and Paraguay.

⁴ This custom lingers to the present day among the Botocudos, a savage tribe of cannibals in Brazil, and the western Eskimo.

⁵ From 1519 to 1522.

⁶ "Magellan's First Voyage Round the World." Hakluyt Society's publications, p. 50.

to winter in the Bay of San Juliano, where an Indian was brought to him who had been surprised by his sailors. This man, says our historian, "was so tall that the tallest of us only came up to his waist; however, he was well built; he had a large face, painted red¹ all round, and his eyes also were painted yellow around them; * * * he was clothed with the skin of a certain beast; * * * this beast has its head and ears of the size of a mule, and the neck and body of the fashion of a camel, the legs of a deer, and the tail like that of the horse. * * * This giant had his feet covered with the skin of this animal in the form of shoes, and he carried in his hand a short and thick bow, * * * with a bundle of cane arrows, which were not very long, and were feathered like ours, but they had no iron at the end, though they had at the end some small white and black cut stones." It was a Tehuelche, to whom Magellan gave the name of Patagon, because of the size of his foot, which was aggravated by the shape of the shoe he wore.

Before the arrival of the Europeans, Guiana was inhabited by a number of petty native tribes, many of them consisting of a few families. The more advanced cultivated fields of manioc, the roots of which supplied all their needs. Their bows and cotton hammocks were their only wealth. Their chiefs had little authority, and they were so totally ignorant of religion that they could not even be called idolaters. They had vague ideas of the existence of a good and an evil spirit, and their only dissipation was to intoxicate themselves with a drink made from manioc root, which was chewed by the old women and then fermented.²

But we need not give any further account of these great discoveries. We must return to the companions of Cortes to tell of the new wonders which awaited them. Even in the most remote districts in the primeval forests covering Chiapas, Guatemala, Honduras, and Yucatan; where through

¹ The women also painted their breasts red. Pigafetta's relation is an obviously gross exaggeration so far as relates to the stature of the natives.

² Ternaux Compans, "Notice Hist. sur la Guyane Française," Paris, 1843, p. 35.

the dense undergrowth a passage had often to be forced, axe in hand; statues, columns, hieroglyphics, unoccupied villages, abandoned palaces, and stately ruins rose on every side, mute witnesses of past ages and of vanished races. Everywhere the conquerors were met by tokens, not only of a civilization even more ancient and probably more advanced than that of the races they subjugated, but also of struggles and wars, those scourges of humanity in every race and every clime.

About three centuries before the arrival of Cortes, the Aztecs, who were to be conquered by him, established themselves in Anahuac,¹ where, after terrible struggles and defeats which, for a time, arrested their progress, they founded Tenochtitlan,² which became their capital. It is almost impossible to fix the exact limits³ of their empire, which stretched from the Atlantic to the Pacific, in the countries now forming Mexico and part of the United States. These limits were constantly varied by the submission of one tribe or the revolt of some other which achieved an ephemeral independence. It is even doubtful whether this empire was not, like the Aztec, little more than a federation of tribes of the Nahuatl race, like the Aztecs themselves, among whom the Acolhuas and Tepanecs were the most important.

One thing is certain: the government, though oppressive to the governed, was by no means firm. Cortes found some faithful friends among discontented tribes and chiefs smarting under injuries received, and it was due to their help that he was able to break the power of Montezuma.⁴ These

¹ The name of Anahuac, very incorrectly given to the Mexican empire, was a general term used in speaking of any country situated about a lake or a large sheet of water. See Brasseur de Bourbourg's "Ruines de Palenqué," Chap. II., p. 32.

² Indian name of the city of Mexico.

³ Bancroft (vol. II., p. 94), following Clavigero, places their boundaries between N. Lat. 18° and 21° on the Atlantic side, and 14° and 19° on the Pacific.

⁴ We follow the spelling generally adopted. The real name of the chief conquered by Cortes was Moctheuzema, or Moktezema.

tribes were probably descended from the Toltecs,¹ who, as we shall see, invaded Mexico before the Aztecs. We are completely in the dark as to this invasion, which modern historians place at about the sixth century of our era. We only know that the Toltecs formed a confederacy, and that each tribe yielded allegiance to an independent chief.² Were these Pelasgians of the New World, as Humboldt calls them, the sole builders of the monuments we are about to describe,—the first inhabitants of the ruined towns for which their descendants have no names? It is very doubtful, although we know that this race has influenced more than any other the history of Central America, and that the language, the religious rites, and the customs of the Toltecs were met with from the Gila river to the isthmus of Panama. But, torn by internecine struggles, decimated by pestilence, they could not successfully resist the Chichimecs. Some withdrew southward and became merged with the Mayas, already settled in Yucatan, and of whose importance we shall also have to speak presently. The Chichimecs are even less known than their rivals,³ and to add to our difficulties their name has now become a general term to designate the unconquered tribes of New Spain. Hence, doubtless, the universal idea that they were wild and barbarous. Bancroft thinks they were of the Nahuatl

¹ Sahagun is the first historian who mentions the Toltecs. Their true name is still uncertain. That given to them by us is derived from their capital Tolan or Tula. According to Humboldt, they were the builders of the mysterious towns scattered throughout Central America, where their supremacy lasted several centuries. A very old tradition says that they are descended from seven chiefs, who came out of the seven caves to which we shall have occasion to refer again.

² Ixtlilxochitl, "Hist. Chichimeca;" Kingsborough, "Mex. Ant.," vol. IX. This historian was descended through the female line from the ancient kings of the country. He was brought up by the Spaniards, and converted to the Catholic faith. He was still living in 1608.

³ "I will only mention the people denominated Chichimecs, under which general name were designated a multitude of tribes inhabiting the mountains north of the valley of Mexico, all of which were chiefly dependent on the result of the chase for their subsistence."—Bancroft, vol. I., p. 617. Becker, "Migrations des Nahuas," *Congrès des Américanistes*, Luxembourg, 1877.

race; others, and amongst them the earliest historians of the country, hold a different opinion, maintaining that their language was wholly different from that of the Nahuas.¹

All these men, whether Toltecs, Chichimecs, or Aztecs, believed that their people came from the North,² and migrated southward, seeking more fertile lands, more genial climates, or perhaps driven before a more warlike race; one wave of emigration succeeding another. We must, according to this tradition, seek in more northern regions the cradle of the Nahuatl race.

In the Mississippi valley are found mounds occasionally of imposing grandeur, huge earth-works, fortifications, village-sites, altars, or tombs, from which are derived the name of Mound-Builders, given to those who constructed them; a title very widely adopted in ignorance of facts which the most recent investigations are only now beginning to place on a sound foundation.

There is, it is now reasonably certain, no good ground for connecting the builders of the earthworks of the Mississippi valley with the Central American people who erected the remarkable monuments which will hereafter be referred to. But, until very recently, it has been a favorite and not unnatural hypothesis which served to temporarily appease an ignorance, pardonable in itself, but now no longer necessary.

Undoubtedly America bears witness to a venerable past; and without admitting the claims of some recent authors,³ who are of opinion that when Europe was inhabited by wandering savages, whose only weapons were roughly hewn

¹ Francesco Pimentel, "*Lenguas Indigenas de Mexico*," vol. I., p. 154.

² The most ancient Mexican traditions speak of a great empire in the North, to which the name of Huchue Tlapallan was given. We shall have to recur to this question again.

³ Agassiz and Lyell lead those who insist upon the great antiquity of the American continent. The latter believes the Mississippi to have flowed along its present bed for more than a hundred thousand years.—"*Second Visit to the United States*," vol. II., p. 188.

of stone, America was already peopled by men who built cities, raised monuments, and had attained to a high degree of culture, we must admit that their civilization and social organization can only have become what it was by degrees. The wealth which roused the avarice of the Spaniards must have accumulated slowly. To erect the monuments of Mexico and Peru, the yet more ancient ones of Central America,—the singular resemblance of which, in some particulars, to the temples and palaces of Egypt,¹ strikes the archæologist,—must have required skilled labor, a numerous population, and an established priesthood, such as could have developed only during the lapse of centuries. During these centuries, the number of which it is impossible to estimate, the people into whose origin we are enquiring were preceded by others more ignorant and barbarous. It is certain that all over the world civilization has increased gradually and by slow degrees. This is a fixed law of humanity to which there is no exception. The olden time was not without its changes, however slowly we may suppose them to have taken place. "The oldest monuments of human labor," says Lyell ("Travels in North America," vol. II., p. 33), "are things of yesterday, in comparison with the effects of physical causes which were in operation after the existing continents had acquired the leading features of hill and valley, river and lake, which now belong to them." To sum up: multitudes of races and nations have arisen upon the American continent and have disappeared, leaving no trace but ruins, mounds, a few wrought stones, or fragments of pottery. History can only preserve facts founded on written records, or *bonâ fide* traditions, and it is from these formulations that it builds up chronology and traces the pedigree of nations. Here all these fail. Those whom we are disposed to call aborigines are perhaps but the conquerors of other races that preceded them; conquerors and conquered are forgotten in a common oblivion, and the names of both have passed from the memory of man.

¹ For these analogies see "Ensayo de un estudio comparativo entre la Pirámide Egypcia y Mexicanas," Mexico, 1871.

Who and what, then, were the first inhabitants of America? Whence did they come? To what immigration was their arrival due? By what disasters were they destroyed? By what routes did they reach these unknown lands? Must we admit different centres of creation? and were the primeval Americans born on American soil? Could evolution and natural selection, those principles so fully accepted by the modern school, have produced on the shores of the Atlantic and the Pacific a type of man resembling the European and the Asiatic, alike in the structure of his frame and in his intellectual development? Vast and formidable are the problems involved in these questions, for they affect at once the past and the future of the human race. We are, however, already in a position to assert that the earliest vestiges of man in America and in Europe resemble each other exactly, and by no means the least extraordinary part of the case is that in the New, as in the Old World, men began the struggle for existence with almost identical means.

One fact now is incontestably secured to science: Man existed in the Old World in the Quaternary period. He was the contemporary, and often the victim, of large animals, the great strength of which can be estimated from the skeletons preserved in our museums. Our early ancestors had to struggle with the bears and lions of the caves, with the terrible *Machairodus* with tusks as sharp as the blade of a dagger, with the Mammoth, and the *Rhinoceros tichorinus*; perhaps, also, with the yet more ancient *Elephas antiquus* and *Rhinoceros etruscus*. The first Americans too were contemporary with gigantic animals which, like their conquerors of Europe, have passed away never to return. They had to contend with the Mastodon, the Megatherium, (fig. 1), the Mylodon (fig. 2), the Megalonyx, the elephant,¹ with a jaguar larger than that of the present day, and a bear more formidable than that of the caves.² Like our

¹*Elephas Colombi* (Owen). Found in both Americas, but it disappeared from the North sooner than from the South.

²Amongst fossil species we must mention the Equidæ, of which numerous

forefathers they had to attack and overcome them with stone hatchets, obsidian knives, and all the wretched weapons the importance of which we have been so long in recognizing in America as in Europe. By the inevitable law of progress, intelligence prevailed over brute force; the animal, in spite of its powerful weapons of offence and defence, was vanquished in a struggle in which every thing seemed to be in its favor; and man, weak and naked though he was, lived on and perpetuated his race.



FIG. 1.—The Megatherium.

Primeval man had not only to contend with pachydermatous¹ and edentate² animals: the period during which he lived was marked by floods, of which man still retains traditions. "If I may judge" says the Abbé Brasseur de Bourbourg,³ "from allusions in the documents that I have been fortunate enough to collect, there were in these

varieties occur from the United States to the La Plata. Recently the bones of a horse have been found in Nebraska which differed little from our own *Equus Caballus*. Of these equine forms we may name the *Hipparion*, *Anchitherium*, *Protohippus*, *Orohippus*, etc., which appear to have been the ancestors of the modern horse. Gaudry, "Les Enchaînements du Monde Animal." Ameghino in "La Antigüedad del Hombre," vol. I., p. 195, concludes from this consecutive series that the horse is of American origin.

¹ From the Greek *παχύδερμος*; or, thick-skinned.

² From the Latin, *Edentatus*; or, toothless.

³ *Arch. de la Com. Scientifique du Mexique*, vol. I., p. 95.

regions, at that remote date, convulsions of nature, deluges, terrible inundations, followed by the upheaval of mountains, accompanied by volcanic eruptions. These traditions, traces of which are also met with in Mexico, Central America, Peru, and Bolivia, point to the conclusion that man existed in these various countries at the time of the upheaval of the Cordilleras, and that the memory of that upheaval has been preserved."¹ Amongst these changes must doubt-



FIG. 2.—The Mylodon.

less be included the glacial epoch which played so important a part in North America, and of which such striking traces are met with over an extensive region. These traces are rocks striated or *moutonnées* (rounded like a sheep's back) by the friction of glaciers, moraines, drift gravels, terraces, and huge erratic blocks which were carried by the ice. In New England glacial striæ have been met with at a height of

¹ It is hardly necessary to observe that this remark is one of many in the writings of the learned but credulous author, which testify more to the strength of his enthusiasm than to the coolness of his judgment.

3,000 feet; in Ohio, the loftiest reach 1,400 feet; while those in Iowa, Michigan, and Wisconsin attain a height of about 1,200 feet above the sea-level.¹ In California, a large area bears witness to the action of glaciers which came down from the Sierra Nevada; while even in the forests of Brazil, in the countries watered by the Amazon, as well as on the vast savannahs of the Meta and the Apuré are found erratic blocks of conical form, which some observers suppose to have been brought down by great glaciers from the Andes.² Agassiz³ tells of similar phenomena in the very heart of the tropics, in the valleys of the Amazon and the Rio de la Plata, and he considered them to be so numerous that he could not but conclude that they extend all over the American continent.

Professor Cook, State Geologist of New Jersey, has made a map of the glaciers of New Jersey. A huge glacier travelled slowly from north to south, grinding, scratching, and polishing all in its path, tearing from the rocks it came across blocks weighing some twenty tons, which it deposited in a terminal moraine as eternal witnesses of its passage. This moraine can still be seen as a vast accumulation of broken rock, gravel, and clay, extending from the Raritan to the Delaware.

These periods of glaciation seem to have been intermittent or perhaps recurrent. Sutton describes two wholly distinct deposits in Kentucky.⁴ According to him, one of those deposits is of earlier date than the formation of the Ohio valley, and the second was not made until after the river had hollowed out its present bed. A few years ago, Professor Newberry announced his discovery, on the very banks of the Ohio, of a "Forest Bed" containing the bones of the

¹ Col. Whittlesey, *Proc. Am. Assoc. for the Advancement of Science*, Buffalo, 1866.

² *Bull. Soc. de Géog.*, April, 1880.

³ "Journey in Brazil." Other geologists, after more careful study, are disposed to doubt the glacial origin of the deposits in Brazil which so much resemble the drift.

⁴ *Proc. Am. Assoc. for the Advancement of Science*, Buffalo, 1866.

mastodon, the mammoth, and of a large beaver-like animal¹ intercalated between two beds of clay, the glacial origin of which appeared to him beyond a doubt. Unequivocal traces of two periods had already been observed near Lake Superior. It is easy to distinguish traces of the one from those of the other; during the first the glaciers, drifted from the northeast to the southwest; during the second, from the north to the south. During the period intervening between the two, North America, especially those districts forming the state of Ohio, was covered with magnificent forests, where mastodons and megatheria found alike a safe retreat and the abundant food they required, as proved beyond a doubt by the remains of their bones mixed with those of huge plants.² Lastly the Geological Survey of Canada³ has in its turn quite recently authenticated two glacial periods: the first and most terrible must have coincided with a general invasion of the ice sheet; the other with a subsequent development of merely local glaciers.

From what remote period does this glaciation date? It is difficult for the human imagination to grasp its causes or its duration; history and tradition are alike silent about them; we only know that, as soon as it came to an end, inundations characterized by violent torrents achieved the modification of the valleys of to-day, and gave to the river system of America the physical configuration which since then has been but little changed.

Man lived through these convulsions⁴; he survived the rigors of the cold; he survived the floods, as the recent discoveries of Dr. Abbott⁵ in the glacial deposits of the Dela-

¹ *Castoroides Ohioensis*, Foster.

² *American Journal of Science*, vol. V., p. 240.

³ *Geological Survey of Canada*, "Report of Progress for 1877-8."

⁴ "I see no reason to doubt," says Putnam, "the general conclusion in regard to the existence of man in glacial times, on the Atlantic coast of North America."

⁵ "Primitive Industry," Salem, Mass., 1881. "Palæolithic Implements from the Drift in the Valley of the Delaware River, near Trenton, New Jersey." "Report Peabody Museum," 1876 and 1878. Th. Belt: "Discovery of Stone Instruments in the Glacial Drift in North America." London, 1878.

ware,¹ near Trenton, N. J., seem to prove beyond a doubt. In the post-tertiary alluvial deposits, consisting of beds of sand and gravel, at a depth varying from five to twenty feet, Abbott found a considerable number of implements evidently fashioned by the hand of man (figs. 3, 4, 5), and greatly resembling the palæolithic implements of Europe, especially the most ancient of all, those of St. Acheul, or of Chelles.



FIG. 3.—Stone implement from the Delaware valley.



FIG. 4.—Scraper found in the Delaware valley.

The objects are of very hard trap,² an argillaceous rock of volcanic origin. Owing to the difficulty of working it is due

¹ The Delaware flows into the Atlantic after a course of three hundred and fifty miles. It forms the boundary between Pennsylvania and New Jersey. Some geologists think that part of the American continent was submerged during the glacial epoch. At that time the Delaware certainly flowed into the sea near Trenton, which is now 130 miles inland.

² "Why should this recently displaced material only yield the rudest forms of chipped stone implements, when the surface is literally covered in some places with ordinary Indian relics, not a specimen of which has as yet occurred in this gravel?" Abbott, "Report Peabody Museum," 1876, p. 35.

³ The deposit of trap nearest to Trenton is thirty miles farther north.

the fact that the secondary chipping is not so perfect as, for instance, it is in the flint axes of the valley of the Somme.¹ They occur in the midst of boulders, some of them twenty feet in diameter, and of rocks striated and polished by the action of ice, or which have been swept along by torrents of water. One of the implements has scratches exactly similar to those of the stones amongst which it was found. This is too important a fact to be omitted.



FIG. 5.—Stone weapon from the Delaware valley.

The Trenton discovery is not an isolated one. Dr. Abbott found other objects, on which the work of human hands is no less evident, in different parts of New Jersey, and he is convinced, that a search made on scientific principles would yield similar results in all the valleys of this state. From the islands of the Susquehanna have been obtained implements exactly resembling the rudest forms of Scandinavian

¹ H. W. Haynes : "The Argillite Implements Found in the Gravels of Delaware River."—*Proc. Boston Society of Nat. Hist.*, Jan., 1881.

origin.¹ Like those of Trenton, they were made by men who probably lived during the glacial epoch, and certainly preceded by many centuries those inhabiting North America on the arrival of the Spaniards.²

A member of the Commission d'Exploration du Mexique, M. Guillemin Tarayre, speaks of the occurrence of worked stones in the post-tertiary beds. He had not time to continue his researches, but late discoveries seem to confirm his report. A hatchet has been found in the Rio Juchipila, near the old town of Teul; in the Guanajuato, a spear point of



FIG. 6.—Hatchet from the alluvial deposits of the Rio Juchipila.

the palæolithic type; in another place an axe like those of St. Acheul, and a scraper which is a fac-simile of those abounding in European museums, (figs. 6, 7, and 8). The scraper (fig. 8) was found a short distance from Mexico, in the undisturbed post-tertiary deposits, and the numerous remains of the *Elephas Colombi*, mixed with productions

¹ Letter of Prof. Haldeman of the 27th Sept., 1877. "Report Peabody Museum," 1878, p. 255. We must also mention a stone hammer found at Pemberton, New Jersey (fig. 9), on which some have supposed they recognized the Swastika, that sacred sign of the Aryans which occurs amongst the Hindoos, Persians, Trojans, Pelasgians, Celts, and Germanic races. On the Pemberton hammer it is roughly enough executed, even if the intent of the artist was to reproduce it, which there is no reason to believe.

² *Nature*, 1878, part I., p. 262; Ameghino, vol. I., p. 148.

of man, indicate that man and this proboscidian were contemporaries.

Hewn stone implements, the work of their hands, are not the only relics of the early inhabitants of America. In many places human bones have been found, associated with numerous fragments of extinct animals.¹ Lund was one of



FIG. 7.—A lance head found near Guanajuato.



FIG. 8.—Stone scraper from a valley near Mexico.

the first² to call attention to them. In a cave excavated in

¹ The earliest examinations were very superficial and the mistakes made are incredible. I cannot give a better proof of this than by mentioning the acceptance as human remains by the Royal Society of London, a century and a half ago, of the bones of a mastodon found near Albany, New York. "Philos. Transactions," vol. XXIX., 1714.

² "On the Occurrence of Fossil Human Bones in South America." Nott and Gliddon, "Types of Mankind," p. 350. Lacerda and Peixotto, "Contribuições ao Estudo Anthropologico das Raças Indigenas do Brazil."—*Archivos do Museu Nacional*, Rio de Janeiro, 1876.

the limestone rocks on the borders of the little lake known as the Lagoa do Sumidouro, in the province of Minas Geraës, Brazil,¹ he dug out the bones of more than thirty individuals, of both sexes and every age, from those of an infant to those of a decrepit old man.

Some skulls were found among these remains, remarkable for their pyramidal form and the narrowness of their foreheads. Lund, writing a few years later, speaks² of some lower jaws which had not only lost all their teeth, but were so much worn that they looked like a bony plate but a few



FIG. 9.—Stone hammer from Pemberton, New Jersey.

lines in thickness. Several skulls had holes in them, all of the same size, of a regular and oblong shape. These were probably inflicted with stone weapons, and were wounds of so serious a nature that the injured cannot have long survived them.

The skeletons,³ were mixed together in such great confu-

¹ This cave is three leagues from Santa Lucia, between the Las Velhas and Paraopeba rivers.

² Letter from Lund to Rafn, dated from Lagoa Santa, 28th of March 1844; *Mém. Soc. Roy. des Antiquaires de Nord*, 1845, p. 49. Cartailhac, "Matériaux pour l'histoire de l'homme," January, 1882.

³ The word skeleton is perhaps inappropriate; most of the skulls being piled up apart, whilst another heap was made of small bones, such as those of the fingers and toes, the wrist or ankle.—Letter from Lund quoted above.

sion as to forbid the idea of their having been buried, and were lying upon the red earth, the original soil of the cave. They were imbedded in hard clay with calcareous incrustations, and covered with large blocks of stone, which had fallen on them from the walls or roof of the cave.

Mixed up promiscuously with the human remains were found those of several animals, chiefly feline¹ and cervine,² still extant in the same region, together with others belonging to species which have now migrated or become extinct. Amongst the last we may name a monkey, (*Callithrix primævus*), a rodent of the size of the tapir, (*Hydrochærus sulcidens*), a peccary (*Dicotyles*) twice as large as the living species, a horse very similar to our own, a large cat bigger than the jaguar (*Felis protopanther*), a llama (*Auchenia*), a Megatherium (*Acelidotherium*, Owen), and several others, such as *Chlamydotherium Humboldtii*, an edentate of the size of the tapir, and the *Platyonyx* of Lund.

The chemical constituents of the human bones are the same as those of the animals with which they were associated, whether in the soil which has remained loose or in that which calcareous infiltration has converted into a breccia of great hardness.³ Doubtless these men and animals lived together and perished together, common victims of catastrophes, the time and cause of which are alike unknown.

These were the results of Lund's first efforts.⁴ Pursuing his researches in the province of Minas Geraës, where he had the perseverance and energy, in spite of constant difficulties, to search more than a thousand caves, he met with human bones again amongst important animal remains, but only in six of all the caves examined. By prolonged and careful work he succeeded in gathering complete specimens of forty-four species now extinct, including several monkeys, some hoplophori,⁵ which were as large as our oxen, and the Smilo-

¹ The Puma (*Felis concolor*), the Ocelot, (*Felis pardalis*).

² *Cervus rufus* and *C. simplicornis*, *Dasypus longicaudis* and *D. mirus*.

³ De Quatrefages *Congrès Anthrop. de Moscou*, 1879. p. 6.

⁴ Lund devoted forty-eight years of his life to the study of the fossil fauna of Brazil.

⁵ *H. euphratus*, *H. Selloyi*, *H. minor*; the last much smaller than its con-

don, a large feline animal akin to the *Machairodus* or sabretoothed tiger, which inhabited Europe in post-tertiary times.

Lund claims the presence of man on the American continent from very remote antiquity, telling us¹ that it dated in South America not only earlier than the discovery of that part of the world by Europeans, but far back in historic times,—perhaps even farther than that, in geological times,—as several species of animals seem to have disappeared from the fauna since the appearance of man in the Western Hemisphere. The learned Dane did not arrive at this conclusion without much hesitation, which is reflected in his writings. Indeed, at first, after his remarkable discoveries, he dated the bones of the Lagoa Santa within historic times.²

M. Gaudry accepts without hesitation Lund's final conclusions.³ He thinks, however, that a distinction must be recognized between two post-tertiary deposits in the Sumidouro cave. The first and thickest is characterized by the occurrence of the bones of the extinct animals, such as the *Platyonyx* and the *Chlamydothorium*, and must correspond with the age of the Mammoth in Europe and North America; the second stratum is characterized by the occurrence of more recent species, and would be represented by the Reindeer period of Europe. It is with the latter that the human bones must be connected. The only proofs, therefore, that we have of the existence of man in Brazil during the post-tertiary period are of more recent date than the traces of pre-historic man in Europe; but we must hasten to add that this conclusion may easily be modified by later discoveries

genera. Pictet places the hoplophori with the glyptodonts amongst the Edentates ("Palæontology," vol. I., p. 273), but there is nothing to prove, as has been claimed, that the Hoplophorus had a cuirass like that of the Glyptodon.

¹ Letter to Rafn, p. 5.

² "In my opinion," said M. De Quatrefages, at Moscow, "the honor is incontestably due to Lund of having discovered fossil man on the American continent, and of having proved his discovery at a time when the existence of that man was considered more than doubtful by the most competent European authorities."

³ His letter was quoted by M. De Quatrefages: *Congr. Anthropol. de Moscou*, 1879.

In the French colony of Guiana, man existed when a large portion of the country was submerged in consequence of a subsidence of the soil. Traces of his occupation can be made out, and polished stone hatchets have been found on the banks of the Maroni, Sinnamari, Cayenne, and Arouague rivers.¹ Strobel has recently described² earthenware vessels of the most primitive construction, and chalcedony arrow-heads from the banks of the La Plata, which appear to have belonged to the earliest inhabitants of that region; and the *paraderos*³ of Patagonia have yielded many triangular arrow-points, some resembling European, others Peruvian types⁴ (fig. 10). Under very different biological and



FIG. 10.—Arrow-point from Patagonia.

climatic conditions, pre-historic man has produced objects exactly similar. We shall often recur to this singular fact, which is in full accord with modern research in other sciences as well as archæology.

We must enumerate the most important of these recent

¹ Maurel, *Bull. Soc. Anthr.*, April, 1878.

² "Materiali di Paleontologia comparata, raccolti in Sud-America." Parma, 1868.

³ The word *paraderos* comes from *parar*, to sojourn. The *paraderos* are supposed to occupy the sites of ancient habitations, on account of the numerous fragments of burnt earth strewn about them, which seem to have been used for hearths.

⁴ Moreno: "Les Paraderos préh. de la Patagonie," *Rev. d' Anthr.*, 1874.

discoveries. Several years ago Séguin collected on the borders of the Rio Carcaraña (in the province of Buenos Ayres) numerous bones of extinct animals,¹ including those of a bear larger than the cave bear,² a horse, the mastodon, and the megatherium. With these remains lay human bones, such as fragments of skulls, jaw-bones, vertebræ, ribs, long bones, belonging to at least four different individuals. The material in which they were imbedded resembled in every respect that containing the bones of animals, and there could be no serious doubt as to their being contempo-



FIG. 11.—Arrow-points in the Ameghino collection.

aneous. This was not, however, the case with four implements of hewn stone³ of the neolithic type; they were, it is true, found in the same formation, but not in the same stratum, so that with regard to them certain reservations must be made.⁴

We will now speak of another explorer. Ameghino⁵ tells

¹ Gervais, *Journal de Zoologie*, vol. II., 1872. The mammals of which Séguin found remains, are the *Arctotherium Bonaerensis*, the *Hydrochaerus magnus*, the *Mastodon*, the *Megatherium Americanus*, the *Lestodon trigonidens*, the *Euryurus rudis*, and a horse of uncertain species (Ameghino, "La Antigüedad del Hombre en el Plata," vol. II., p. 526).

² *Ursus spelæus*: its bones occur in great numbers in all the post-tertiary strata of Europe.

³ Three are of quartzite, one of chalcedony.

⁴ Some of these bones and of the hewn flints collected by Séguin were exhibited at the Exposition of 1867. They are now in the Paris Museum.

⁵ Letter of October 31, 1875, in the *Journal de Zoologie*, vol. IV.; "L'Homme préh. dans la Plata" (*Rev. d'Anthr.*, 1879-1880); "La Antigüedad del Hombre en el Plata," 2 vols., 8vo, Paris, 1881.

us that on the banks of the little stream of Frias near Mercedes, twenty leagues from Buenos Ayres, he met with a number of human fossils, mixed with quantities of charcoal, pottery, burnt and scratched bones, arrow-heads, chisels, and stone knives (fig. 11), together with a number of the bones of extinct animals¹ on which were marks of chopping evidently done by the hand of man, pointed bones, knives, and bone-polishers. Afterward Ameghino discovered the actual dwelling of this early American, and his singular choice was the carapax of a gigantic armadillo scientifically known as the glyptodon.² All around the shell lay charcoal,



FIG. 12.—The Glyptodon.

ashes, burnt and split bones, and a few flints. The reddish earth of the original soil was consolidated. Below this level exploration revealed a stone implement, long bones of

¹ In the remarkable work to which we refer our readers, Ameghino gives complete details on the flora and fauna of the pampas. A table in vol. II. shows the tertiary fauna of Patagonia, the fauna of the upper and lower pampas, of the lacustrine pampas, of recent alluvial deposits, and lastly of the fauna of the time of the Spanish conquest. By the help of this table it is easy to form an idea of the range in time of each of the different species. The mammals, bones of which were found by Ameghino mixed with those of man, are: The *Canis cultridens*, the *Hydrochaerus sulcidens*, the *Reithrodon*, the *Toxodon Platenis*, an *Equus*, an *Auchenia* and a *Cervus* of undetermined species, the *Mylodon robustus*, the *Panochatus tuberculatus*, the *Glyptodon reticulatus*, and the *G. typus* ("Ant. del Hombre," vol. II., chs. X., XI., XIV., and XV.).

² Pictet places this animal in the Armadillo family amongst the Edentates. Burmeister (*Ann. de Museo Publico de Buenos Ayres*) mentions a glyptodon of which the shell measured five and a half feet long by about four feet wide and three high.

the deer and llama, some split and bearing evident traces of human workmanship, and teeth of the mylodon and toxodon, also worked. Still later the discovery of another glyptodon shell under nearly similar conditions strengthened Ameghino's convictions.¹ In the midst of the pampas, those vast plains without a tree or rock behind which man might shelter himself from attack by the gigantic animals wandering about, his mother-wit did not desert him. Digging a hole in the ground, he roofed it with the shell of a vanquished glyptodon, thus forming a cave-like retreat.

Ameghino's discoveries led to long discussions. Burmeister² rejected the theory of the contemporaneity of the men and mammals whose bones were found together. The Argentine Scientific Society even refused to listen to the reading of a memoir upon the subject. We cannot accept these decisions. Ameghino asserts that the human bones were mixed with those of the animals³ and that both were covered with dendritic deposits of the oxides of iron and manganese derived from the soil. The same dendrites are met with in the striæ, which is positive proof that these grooves and scratches, which must have been the work of man, were of earlier date than the interment of the bones. Other bones had been split open to get out the marrow, pointed in the shape of an arrow or dagger, and blackened by fire. The charcoal and burnt earth⁴ were certain indi-

¹ "El Hombre seguramente habitaba las corazas de los Glyptodon, pero no siempre las colocaba en la posición que acabo de indicar" ("La Antigüedad del Hombre," vol. II., p. 532).

² *Los caballos fósiles de la pampa Argentina*. Later Burmeister was less positive: "No parece," he says, "que sean contemporáneos de los animales de la época inferior porque carecemos de pruebas para determinar con seguridad que hayan vivido simultáneamente."—"Descripción física de la República Argentina."

³ Ameghino (Vol. II., p. 424) gives a list of the animals to which the striated bones belonged.

⁴ "En algunos puntos se encuentra una gran cantidad de fragmentos informes de tierra cocida de color ladrilloso. ¿Qué es lo que indican? Son los productos de los primeros ensayos en el arte cerámico ó son el simple resultado de la acción del fuego de un fogón encendido por el hombre de la época del Glyptodon."—"Ameghino." Vol. I., p. 427.

cations of the hearths of men. The stones could have been fashioned only by the hand of man. We think, therefore, with Ameghino, that man lived in South America with animals long since extinct; that he chased the deer, the llamas, and several little rodents whose bones occur with his own; that he was not afraid to attack the glyptodon, toxodon,¹ the megatherium, and the mastodon. Their flesh served for his food, their skins for his garments, and their bones became his implements and weapons, in lieu of silicious and quartzite stones, which often were only to be obtained from a distance. All this seems to us to be absolutely proved.²

There remains one important question to be solved. At what period were the pampas formed? To what geological time must we assign the upper stratum where the human bones were found? Darwin considers it of recent, Burmeister of Quaternary, and Bravard and Ameghino of Pliocene formation. Opinions differ no less as to the mode of its formation. D'Orbigny says that, in Tertiary times, the sea covered a great part of the Argentine territory; the upheaval of the Andes caused great changes in the adjacent region, and, incidentally, the formation of the pampean deposits of argillaceous sand. Darwin also admits this hypothesis.³ Lund thinks the pampas are alluvial deposits, brought by a great flood which covered the whole of South America. Bravard sees in them the result of volcanic cinders, sand, and dust drifted by strong winds; other geologists think they are the sediment brought down in the time of great floods by the countless streams flowing from the Andes. Dr. Burmeister speaks of the action of ice. To

¹ *Toxodon platensis*, Owen. The first was discovered on the borders of the Rio Negro, 120 miles northwest of Montevideo; the length of its head was two feet four inches. Later, several species have been recognized.

² Ameghino's has not remained the only discovery. We shall mention another later (Chap. IX.).

³ It is remarkable that the deposits of the pampas contain no marine shells. This is a serious objection to the exclusive system advocated by Darwin and D'Orbigny.

him the pampean deposits appear to be some pre-glacial and others post-glacial, each characterized by a different fauna; but the most recent researches justly reject the idea of sudden and complete changes with the fauna appearing and disappearing abruptly. No fauna has thus appeared and disappeared. Moreover, Ameghino calls our attention to great mammals, such as the smilodon, the *Felis longifrons*, the toxodon, and the mastodon in successive strata, the two last named even occurring in comparatively recent times. The hoplophorus, the megatherium, and the mylodon, especially classed by Burmeister among pre-glacial animals, occur in the upper strata of the pampas. On the other hand the species quoted as characteristic of the post-glacial epoch are met with in every stratum. Without prolonging the discussion we will add that the formation of the pampas certainly took a long time, "*largos y largos siglos*," says Ameghino; that they are the result of many and varied causes, and that all those which we have just enumerated, with perhaps others also, undoubtedly contributed to their production. If it is difficult, in the present state of knowledge, to assign to each of these causes its exact rôle, it is still more impossible to place them in a definite epoch, and the difficulties are greatly increased by the fact that geological periods are not synchronous in Europe and America, and if ever they are assimilated more perfectly than now, it will only be after long and patient researches.

We must not omit to mention a skull discovered by Dr. Moreno, in 1874, on the banks of the Rio Negro, Patagonia, at a depth of thirteen feet, in a bed of gravel and yellow sand, which he considers¹ to be of a contemporaneous formation with the subsoil of the pampas. Although there were no bones with this skull to aid in the exact determination of its age, Moreno thinks it very ancient, and calls attention to its remarkable artificial deformation, resembling that which has always prevailed amongst the Aymaras, and is also met with among tribes more than six hundred leagues

¹ *Bull. Soc. Anthr.*, 1880, p. 490.

from them. Broca has also pointed out the traces left on the forehead by periostitis, and he does not hesitate to attribute this scar to a syphilitic disease. This is a very interesting pathological fact.

Moreno had previously collected many human bones in the ancient cemeteries of Patagonia. That they are very ancient no one can doubt, but to fix their real age with any certainty is very difficult. The skeletons were generally seated, with the face turned outward, the knees drawn up to the breast, one foot resting on the other, and the hands crossed on the shins. This is much the same position as that of Peruvian and Aleutian mummies. With the skeletons were found arrow-points of many different shapes and of many kinds of stone, little flint knives, fragments of pottery ornamented with dots, straight, waving, and zig-zag lines; bowls of sandstone, diorite, or porphyry; stone mortars—one of them fourteen inches in diameter; shells of different kinds; and, lastly, the bones of the guanaco and ostrich split lengthwise. Some of the human bones were dyed red. As some Indians were still in the habit during the last century of painting their faces red before starting on an expedition, it is supposed that these bones belonged to warriors killed in battle. It is useful to note this fact, but we must add that the funeral rites to which the remains bear witness would not date back to the Quaternary period, nor have been practised by the contemporaries of the mylodon or glyptodon.

The discoveries in North America would be no less curious, if we could but accept them with more confidence. This reservation made, we must mention them, if only to show that sometimes even masters in science allow themselves to be carried away by their imaginations, and even more by pre-conceived ideas. In 1848, Count F. de Pourtales found some human jaws with the teeth still in them, and part of the bones of a human foot, in a conglomerate made up of fragments of coral or broken shells and imbedded in the perpendicular rocks overhanging Lake Monroe,

Florida, about ten miles from the coast. Agassiz¹ informed the scientific world of the fact, and considering that the land here gains on the sea at the rate of about a foot in a century, he allowed for the coral-bank an age of 13,300 years, and for the bones imbedded in it 10,000 years. Lyell,² Wilson,³ and with them many other scientific men, had accepted the fact of the discovery, with the consequences resulting from it, when a letter from the Count de Pourtales put an end to a controversy which had extended over many years, by asserting that the human bones were found not in the coral conglomerate, but in a fresh-water calcareous deposit distinctly characterized by mollusks⁴ such as still live in the lake.

In the löess of the Mississippi at Natchez, Dr. Dickson found, side by side with the bones of the mylodon and megalonyx, a human pelvis,⁵ blackened like them by time, and still more by the peat in which they were all lying. This time, Sir Charles Lyell showed more reserve; he observed that the human bone might have come from the very numerous Indian burial-places in the neighborhood, and have been carried along by water.⁶ Sir J. Lubbock did not express his opinions, but he extended a certain amount of credit to the opinion of Usher, who regarded the bones in question as fossil.⁷ We must also mention that Dr. Leidy adopted the wiser course, and refrained until the reception of more complete evidence from coming to any conclusions as to the contemporaneity of man with the mammals amongst the remains of which his bones were mixed.

¹ Agassiz' Lecture.—*Mobile Daily Tribune*, April 14, 1855. Nott and Gliddon, "Types of Mankind," p. 352.

² "Antiquity of Man," p. 44.

³ "Pre-historic Man," p. 12.

⁴ He met especially with *Ampullaria* and *Paludina*.—*Am. Naturalist*, vol. II., p. 443, Oct., 1868.

⁵ *Oz innominatum*. Nott and Gliddon, "Types of Mankind," p. 349.

⁶ "Second Visit to America in 1846," vol. II., p. 197; "Antiquity of Man," Chap. X.

⁷ "Pre-historic Man." Southall, "Recent Origin of Man," p. 551—Short, "North Americans of Antiquity," p. 114.

The plains stretching from New Orleans to the Gulf of Mexico are low and wet. In crossing them it is difficult to distinguish between dry land and the marshes covered with water-plants. These wild solitudes, shut in by a barren horizon, are the haunt of fevers, and tenanted by reptiles and insects of all kinds. The energy of man has succeeded in conquering the resistance of nature, and one of the chief cities of the South rises from alluvial deposits of the Mississippi, which attain at certain points a height of five hundred feet. Trenches, dug some years ago for laying down gas-pipes, laid bare several successive strata of ancient forest, in which geologists have made out ten generations of trees which have been buried for some centuries.¹ In a bed belonging to the fourth forest, at a depth of sixteen feet, amongst the trunks of trees and fragments of burnt wood, lay a skeleton. The skull was beneath a gigantic cypress, which lived many years after the owner of the head, and had in its turn succumbed.² In estimating the time required for the growth of the trees with the duration of the various forest deposits, Bennet Dowler asserts the age of the human remains at 57,000 years. This is too hypothetical a calculation to be worth discussion. Dr. Dowler seems to have felt this himself, for in a later calculation he gives the skeleton an antiquity of 14,400³ years! Like the first quoted, these figures rest on no solid foundation, if, as Dr. Foster⁴ very reasonably suggests, the so-called forests successively laid low, were but trees carried down by the river in its frequent

¹ "Picture of New Orleans," 1852; Nott and Gliddon, "Types of Mankind," p. 338; Lyell, "Antiquity of Man," pp. 44 and 200; Huxley, "Man's Place in Nature," Note by Dr. Daly; Lubbock, "L'Homme Préh., p. 261; Southall, "Recent Origin of Man," pp. 470 and 551.

² The cypress (*Taxodium distichum*) lives to a great age. Adanson mentions one, which he believes to have lived 5,200 years, and Humboldt speaks of another at Chapultepec, already old in the time of Montezuma, which he thinks has lived at least 6,000 years, but these estimates must be taken as subject to immense reduction.

³ We give these estimates as quoted in a recent book. (Short's "American Indians," p. 123.)

⁴ "Prehistoric Races of the United States of America," p. 76.

inundations, and deposited with alluvial loam where the Mississippi empties its waters into the sea. The same conclusion is arrived at, if we accept Dr. Hilgard's opinion, who looks upon the bed in which the skeleton lay, as a recent alluvial deposit.

In a salt mine on the island of Petit Anse, Louisiana, was found a mat made of interlaced reeds.¹ The salt occurs at a depth of fifteen to twenty feet, and the fragment of mat was found at the level of the first deposit of salt. Two feet above lay some fragments of the tusks or bones of an elephant. Man and the proboscidian had lived at the same time and met death at the same place.

In the bottom land of the Bourbeuse River, Gasconade County, Missouri, Dr. Koch discovered the remains of a mastodon.² This animal, one of the largest known, had sunk in the mud of the marshes; borne down by its own weight, it had been unable to regain its footing, and had fallen on its right side. Some men had seen it in this position, and had at first attacked it from a distance, throwing at it arrows, stones, and pieces of rock, of which a great number are mixed with its bones; then, to get the better of it the more easily, they had succeeded in lighting fires round it, to which the heaps of cinders, some of them as much as six feet high, still bear witness. The arrows, lance-points, and knives were certainly the work of man, and the pieces of rock, some of them weighing no less than twenty-five pounds, had been brought from a distance. Every thing seems to prove the exact truth of the scene described by Koch. The following

¹*Arundinaria macrosperma*. This mat is now in the National Museum at Washington.

² Koch announced his discovery in many pamphlets of little scientific value. Dana has preserved the titles of a great many; among them, see Koch's "Evidence on the Contemporaneity of Man and the Mastodon in Missouri." *American Journal of Science and Arts*, May, 1875. Consult also Foster ("Preh. Races," p. 62); Rau, ("North Am. Stone Implements", *Smith Cont.*, 1872,) who admits the authenticity of Koch's discovery, and Short ("North Americans") who denies it. Schoolcraft, (Vol. I., p. 174) says of the bones of the mastodon discovered near the Potato River, that they were not petrified, which throws a doubt on their great antiquity.

year he made a somewhat similar discovery in Benton County, Missouri. At about ten miles from the junction of the Potato River with the Osage, he found, under the thigh-bone of a mastodon, an arrow of pink quartz, and a little farther off, also in the direction of the animal, four other arrows,¹ which to all appearance had been shot at him.²

These observations are very likely correct; but unfortunately Koch's want of scientific knowledge³ and the exaggerations with which he accompanied his story, at first threw some discredit upon the facts themselves. But the recent discoveries of Dr. Aughey in Iowa and Nebraska have now confirmed them. There, too, the bones of the mastodon have been found mixed with numerous stone weapons; and man, we learn to our surprise, armed with these feeble weapons, not only did not fear to attack the gigantic animal, but succeeded in vanquishing it.

In the Sierra Nevada region, at various localities on the Pacific coast, numerous traces of the presence of man are met with. The discovery of implements or weapons at a depth of several hundred feet, in diversely stratified beds showing no trace of displacement, simply implies that the country was peopled many centuries before the arrival of the Spaniards, and that the inhabitants were witnesses of the convulsions of nature, of the volcanic phenomena, which brought about such remarkable changes. But when the bones of man and the results of his very primitive industry are associated with the remains of animals which have been extinct for a period of time of which it is difficult to estimate the length, it is impossible not to date the existence of that man from the most remote antiquity.⁴

These facts are confirmed in California, Colorado (fig. 13),

¹ Three of these arrows were of agate and one of bluish-colored silice.

² "Trans. of the Saint Louis Academy of Sciences," 1857.

³ Koch was chiefly great as a skilful and persevering collector. The American and European museums abound in specimens collected by him. He was the discoverer, among other things, of the magnificent mastodon of the British Museum.

⁴ Bancroft, vol. IV., p. 697.



Wyoming, wherever a search has been possible. In a manuscript which we believe to be still unpublished, Voy¹ describes numerous and interesting discoveries, all carefully verified. We will mention two stone mortars found in some auriferous gravel near Table Mountain, one in 1858, at a depth of three hundred feet, the other in 1862, forty feet lower down, under a bed of lava four hundred feet thick; and at St. Andrews, several similar mortars, such as abound all over California. We confine ourselves to the following rather dry enumeration; Dr. Snell speaks of a pendant of siliceous schist and several lance-points. From Shaw's Flat there are ornaments of calc-spar and a granite mortar; near Sonora and at Kincaid's Flat, stone implements; at Gold Spring gulch, an oval granite dish more than eighteen inches in diameter, two to three inches thick, and weighing forty pounds; at Georgetown several very similar dishes. Everywhere these flints, mortars, and dishes were associated with the bones of the mastodon, of the elephant, of a large tapir, and of other extinct animals. It has been the fashion to attribute these objects, evidently the work of man, to a savage and cannibal race, extinct with the animals amongst which it lived, and having nothing in common with the Indians of the present day.²

Traces of ancient mining operations are also met with in several places in North America; but all we know about them is that they are of much earlier date than the Spanish conquest. Mention is made of ancient mines of cinnabar existing in California,³ where the rocks have given way, burying in their fall the miners, whose skeletons lay at the bottom of the mine beside clumsy stone hammers, the only tools of these savage workmen. Similar hammers have been found in the Lake Superior mines.⁴ We shall recur to this subject;

¹ "Relics of the Stone Age in California."

² Bancroft, vol. III., p. 549. He quotes an unpublished manuscript of Powers. In appendix A, we give the chief discoveries and the fauna associated with them.

³ Bancroft, vol. IV., p. 696. The Spaniards gave the name of Almaden to these mines in memory of those of their country.

⁴ "Report of the Am. Assoc. for the Adv. of Science." Cambridge, Mass., 1849.

but we may add now that the workmanship of these objects is similar to that of the Indians, and need not be attributed to a different race.

Berthoud tells us that in the Tertiary gravels at Cow's Creek, and near the South Platte River, he found some stone implements, together with which he picked up some shells that he assigns to the most ancient beds of the Pliocene deposits, perhaps even to those of the Miocene period. These are, it must be admitted, but feeble proofs of a fact of such capital importance as the existence of man in tertiary times.¹



FIG. 14.—The Calaveras skull, after Whitney.

The discovery we have still to mention has been discussed in all the learned societies of America and Europe; and although a satisfactory solution of it has not yet been arrived at, it will be well to give such details as are possible. In 1857, a fragment of a human skull was found, associated with the bones of the mastodon, in the auriferous gravel of Table Mountain, California, at a depth of 180 feet. Dr. C. F. Winslow sent this fragment to the Natural History Society of Boston,² where it attracted little attention, because

¹ Berthoud says he found these objects in 40° N. Lat., and 104° W. Long. Philadelphia Academy of Natural Sciences, 1872.

² Whitney, "Auriferous Gravels of the Sierra Nevada," p. 264.

there was no evidence concerning the age of deposit. A fragment from the same skull was also given by Dr. Winslow to the Philadelphia Academy of Natural Sciences.

A few years later, *i. e.*, in 1866, Professor J. D. Whitney, Director of the Geological Survey of California, announced the discovery of a skull, this time nearly complete (fig. 14), at a depth of about a hundred and thirty feet, in a bed of auriferous gravel on the western slope of the Sierra Nevada (Calaveras County). The deposit rested on a bed of lava and was covered with several layers, some of lava, some of volcanic deposits, overlying beds of gravel.¹ This succession of strata indicates long periods of agitation, during which inundations alternated with eruptions. If the facts reported be correct, the waters have more than once invaded the districts inhabited by man, and burning lava from volcanoes has dried up the rivers at their sources.

The skull was imbedded in consolidated gravel, in which were several other fragments of human bones, the remains of some small mammals which it was impossible to class, and a shell of a land snail (*Helix mormonum*). Beside them lay some completely fossilized wood. We must add that the shaft of the mine, from which the skull was taken, has since become filled with water, and any further examination has become impracticable on account of the expense involved in pumping it out.

Though the Calaveras skull was associated with no mammal bones, with the aid of which its age might be fixed, it is a fact that, in other parts of the Sierra Nevada, gravels of an identical kind have yielded the bones of extinct animals. There are deposits in California and Oregon where, to use a

¹ We give a list, from the "Materiaux pour l'Histoire Primitive et Naturelle de l'Homme," of the series of deposits from above downward.

1 black lava	40 ft.	6 gravels	25 ft.
2 gravels	3 "	7 brown lava	9 "
3 white lava	30 "	8 gravels	5 "
4 gravels	5 "	9 red lava	4 "
5 white lava	15 "	10 red gravels	17 "

According to the proprietor of the mine, it is in bed No. 8 that the skull under notice was found.

popular expression, the remains of elephants and mastodons might be had by the wagon-load. Beside gigantic pachydermata we meet with the *Palæolama*, the *Elothorium*,¹ extinct oxen, *Hipparion*, and several kinds of horses. The fossil flora, impressions of which are of frequent occurrence in the argillaceous deposits, also presents notable differences from that of to-day.² It contains elms, figs, alders, and other trees of Europe; but we notice particularly the complete absence of coniferous trees, which now give to the flora of California its distinctive character. Whitney also calls attention, in support of his theory, to such implements as lance-points, stone hatchets, mortars, doubtless used for grinding grain or kernels, all bearing witness to the presence of man, and which have been found in many places buried beneath beds of lava. The following are the terms in which he announces his discovery to M. Desor: "My chief interest now centres in the human remains, and in the works from the hand of man that have been found in the Tertiary strata of California, the existence of which I have been able to verify during the last few months. Evidence has now accumulated to such an extent that I feel no hesitation in saying that we have unequivocal proofs of the existence of man on the Pacific coasts prior to the glacial period, prior to the period of the mastodon and the elephant, at a time when animal and vegetable life were entirely different from what they are now, and since which a vertical erosion of from two to three thousand feet of hard rock strata has taken place." The scientific world awaited with natural impatience the confirmation of these discoveries. Desor constituted himself the spokesman of his colleagues, and in 1872 Whitney replied to him³: "You may rely upon my publishing this fact, with all its details, as soon as the necessary maps are engraved, and I

¹ According to Pictet, belonging to the *Pachydermata* and the family of *Suidæ*. In appendix A. we give the list of the fauna drawn up by Whitney, in his "Auriferous Gravels."

² Lesquereux made out in the flora of the mining districts forms belonging to the Pliocene period, and even approaching those of the Miocene.

³ *Revue d'Anthrop.*, 1872, p. 760.

have completely finished my survey of the geology of the region. It will then be seen that there has been no mistake. The mere publication of the fact that human remains and products of human industry have been found beneath the volcanic emissions of the Sierra Nevada would prove nothing, if the geological structure of the region had not at the same time been determined with sufficient precision for every one to be able to appreciate, from a scientific point of view, the significance of this discovery. Rest assured that the Calaveras County skull is not an isolated fact, but that I have a whole series of well-authenticated cases of the finding, in the same geological position, of either human remains or objects of human workmanship." To make these statements complete, a geologist of Philadelphia at the same time informed the Abbé Bourgeois that Whitney had collected, in the Pliocene strata of California, in nine different places, human bones or relics of human industry, and that these facts were destined to remove all uncertainty.¹

For the next eight years Whitney published no details of his discoveries, and the newspapers reported, without his taking the trouble to contradict it, the assertion that he had been the victim of an unfortunate hoax.

Subsequently he referred to the subject in a lecture at Harvard University, in Cambridge, Massachusetts, and since then has fully discussed the subject in the works to which his name gives a legitimate importance. He maintains the authenticity of his discovery, as attested by the researches he has made in person, while admitting that the finders of the skull were but ignorant laborers, and that no competent person saw it in its original position.²

No proof is afforded by the characteristics of the skull. It resembles the Eskimo type, and the very prominent supra-orbital ridges form its most distinguishing feature. Chemi-

¹ "Materiaux pour l'Histoire Primitive et Naturelle de l'Homme," 1873, p. 55.

² Whitney: "Lecture in Cambridge," April 25, 1878. "The Calaveras Skull: Memoirs of the Museum of Comparative Zoology of Harvard College," vol. VI.

cal analysis gives no decided verdict. It shows that the skull contains a slight trace of organic matter,¹ and that phosphate of lime is partly replaced by carbonate.

We note these two facts, which seem to us important. It seems unlikely that traces of organic matter, however slight they may be, could have been preserved throughout the vast periods of time separating our own from the Tertiary period. No less unexpected would be the resemblance of a skull of that age to the skulls of the Eskimo of to-day, and it is difficult to admit the perpetuation of a type without appreciable modifications during the incalculable ages in which all nature has undergone so complete a transformation.²

The conclusions to be arrived at seem to us simple. Without doubt man lived in California, and Whitney's narrative is one more proof added to those already quoted, during the time when the volcanoes of the Sierra Nevada were in full action, before the great extension of the glaciers, before the formation of the valleys and the deep ravines, at a period when the flora and the fauna were totally different from those of to-day. But Whitney himself admits that if the eruption of the great mass of volcanic matter began toward the Pliocene period, it certainly lasted throughout the whole of the post-Pliocene period, and even during recent times. All initial or final dates are therefore wanting, and even if it were possible to determine them it would be impossible to assert positively that there had been no displacement at any given point, when the ground had been rent asunder by such terrible convulsions as volcanic eruptions. Even those who admit the authenticity of the Calaveras skull should reserve their opinion as to the period from which it dates, till the question has been more fully

¹ "The skull being as nearly deprived of its organic matter as fossil bones of the Tertiary period usually are." Whitney, p. 271; on page 269 is given the analysis.

² It seems certain, for instance, that at the period to which Whitney refers this skull, the climate of California was tropical.—"Proceedings of California Acad. of Sciences," 1875, p. 389.

studied from a scientific point of view, apart from the fierce controversies that these questions too often provoke. In 1877 Prof. March said at Nashville ("Am. Ass. for the Advancement of Science"): "The evidence as it stands to-day, although not conclusive, seems to place the appearance of man in this country in the Pliocene; and the best proof of this has been found on the Pacific coast."¹

If, however, we hesitate as yet to admit the existence of man on the American continent in the Tertiary period, it is difficult to deny that long centuries have rolled by since the time when these unknown men lived amongst animals as little known as themselves. This is, in the present state of pre-historic science, the only decision possible. Other parts of this work will introduce the reader to other races with different tastes, different manners, and probably a different origin. History and tradition are silent about them, as about their predecessors, and long and patient researches are necessary to separate the few still obscure facts from the profound darkness enveloping them. May the difficulties of the task be our excuse, if inevitable errors creep into our narrative.

¹No reasonable person who has impartially reviewed the evidence brought together by Whitney, and who saw, as we did, the Calaveras skull in its original condition, can doubt that it was found, as alleged by the discoverers, in the auriferous gravels below the lava. The only question to which some uncertainty still attaches itself among geologists is that of the true age of these gravels in geological time; and whether all the extinct species of which remains are found in them were contemporaneous with the deposition of the gravels, and with the then undoubted presence of man.—[*Am. Editor.*]

CHAPTER II.

THE KITCHEN-MIDDENS AND THE CAVES.

AT the close of the last chapter we said that other men with different manners and tastes, perhaps also of different origin, replaced the first inhabitants of America. A considerable change took place, and we have not now to deal with nomad savages, wandering without shelter in the forests of the North and the pampas of the South; we are to make acquaintance with a numerous population living in social intercourse, and dwelling for long periods in a single locality. The great difference in the fauna helps us to realize the importance of the change that had come about, and also the immense length of time necessary to its accomplishment. Though these men, who doubtless arrived in successive migrations, were still rude and barbarous, the permanence of their homes was already a great step in advance, and attentive study enables us to discover the germs of a more advanced civilization, which would develop still more rapidly among those who should succeed them.

Every thing is of importance in treating of the existence of man in those times, which but yesterday were totally unknown. From this point of view the kitchen-middens (literally kitchen-heaps), as the heaps of rubbish and offal of all kinds which accumulate about the dwellings of man have come to be called, deserve special attention.¹ Excavations in them in the different countries of Europe have yielded the most interesting results. They have revealed the every-day life,

¹ These heaps of rubbish in America are so generally composed almost entirely of marine or fresh-water shells, that the term *shell-heap*, as applied to them, has here largely replaced the more cumbrous term derived from the Danish.

the food, the manners, the journeys, and the migrations of pre-historic men; their progress can be followed and their gradual improvement noted. The excavators have collected hatchets, knives, implements of all kinds, in stone, in horn, and in bone; fragments of pottery, and of charred wood. Amongst the cinders of these hearths, abandoned for centuries, have been found numerous bones of animals and birds, fish bones, shells of oysters, cockles, and other mollusks, all telling of the prolonged residence of man. No less numerous are the kitchen-middens or shell-heaps in America, and wherever excavations have been made they have been most fruitful in results.¹ Immense heaps of shells, the gradual accumulations of man, stretch along the coasts of Newfoundland, Nova Scotia, Massachusetts, Louisiana, and Nicaragua, where deposits are described dating from the most remote antiquity. They are met with again in the Guianas, Brazil, and Patagonia; near the mouths of the Orinoco; on the shores of the Gulf of Mexico; on the coasts of the Pacific, as well as on those of the Atlantic; and the shell-mounds of Tierra del Fuego and of Alaska can be made out from afar by the navigator, on account of their green color, the herbage being darker and more luxuriant than that of the adjacent surface.

Some of these shell-heaps are of considerable dimensions. Sir Charles Lyell describes one on St. Simon's Island at the mouth of the Altamaha River in Georgia, which covers ten acres of ground, to a depth varying from five to ten feet. It is formed almost entirely of oyster-shells, and excavations have yielded hatchets, stone arrow-heads, and some fragments of pottery.² Another at the mouth of the St. John's

¹ The report of the Pre-historic Congress held at Bologna, in 1871, gives a fairly complete list of the authors who have written about the American shell-heaps. See also "Reports of the Peabody Museum of Archaeology, Cambridge, Mass.," vol. II.; and of the "Am. Association for the Adv. of Science," Chicago, 1867; Detroit, 1875; and Wyman's articles in the *American Naturalist*, 1868.

² "Second Visit to the United States," vol. I., p. 152.—"British Ass. Rep. for 1859." Address of the President.

River, consisting, like that visited by Lyell, of oyster-shells of extraordinary size, is three hundred feet in length, with a width not exactly determined, but which is certainly several hundred feet. The shell-heaps of Florida and Alabama are yet more considerable. There is one on Amelia Island of a quarter of a mile in extent, with a depth of about three and a width of nearly five hundred feet. That of Bear Point covers sixty acres of ground; that of Anercerty Point, one hundred; and that of Santa Rosa, one hundred and fifty. Others are of a considerable height: Turtle mound, near Smyrna, is a mass of shells attaining a height of thirty feet, and many others are more than forty feet high.¹ In all these shell heaps quantities of shells have been collected, although much of the ground they occupy has not yet been examined: large trees, roots, tropical creepers, and other climbing plants covering them with often impenetrable thickets.

All the shell mounds just enumerated are situated on the shores of the sea, or in its immediate vicinity. One, however, is mentioned fifty miles beyond Mobile, consisting almost entirely of marine shells. This fact implies a considerable alteration in the elevation of the shores since the time of pre-historic men; for it is not very likely that he would have taken the trouble to carry the shell-fish necessary for his daily food to such a distance, when it would have been so easy to set up his dwelling-place close to the beach.

Dr. Jones has explored forty shell-heaps on Colonel Island, Georgia.² The whole island, he tells us, is covered with shell-mounds. Similar heaps, chiefly formed of the shells of oysters, clams, and mussels, are of very frequent occurrence in Maine and Massachusetts, and excavations have yielded results no less interesting. Dr. Jeffries Wyman has noted the rarity of stone implements, which are replaced by articles of bone, which are very common. Fragments of pottery are not abundant; the ornamentation, always coarse, presents little resemblance to the most

¹ Brinton: "Notes on the Floridian Peninsula." Philadelphia, 1859.

² "Antiquities of the Southern Indians and Georgia Tribes."

ancient European pottery. The ornamentation was produced by tracteries made on the soft clay either with the point of a shell, or of a sharp stone.¹ The bones of animals are numerous.² Wyman met with those of the elk, the reindeer,³ the Virginian deer (*Cervus Virginianus*), the most common of all; the beaver, the seal, the mud-turtle, the great auk, and the wild turkey. Except the auk (*Alca immensis*), which was before its extinction only found in the extreme north, all these animals lived in Maine in historic times. The caribou, though much rarer than of old, is still met with in the same region. The dog should also be men-



FIG. 15.—Various stone and bone implements from California.

tioned. Many bones bear marks of his teeth; so that he lived with man and was subject to him, at least as much so as his wild nature permitted. Some of these important

¹This primitive mode of ornamentation has been met with in Missouri, Illinois, Ohio, Tennessee, and Florida. "Report, Peabody Museum," 1872.

²In appendix B. we give a complete list of the mammals, birds, reptiles, fish, and mollusca found by Jeffries Wyman in the shell-heaps of Mount Desert and Couch's Cove, Eagle Hill and Cotuit Port.

³The reindeer or caribou (*Rangifer caribou*) is still found within the confines of Maine; but the wild turkey has become virtually extinct in New England. The elk is not found nearer than the Alleghany Mountains, and the great auk has retreated beyond the confines of the United States, if not extinct. —Wyman, "Report, Peabody Museum," 1868, p. 11.

excavations were made under the supervision of American anthropologists, after the meeting in 1868, at Chicago, of the Association for the Advancement of Science. A mound opened on that occasion, covered an area of ten acres. Oyster-shells, cod bones, some of the bones of a dog, and those of a large deer were found; all relics bearing witness to the presence of men living entirely on the products of fisheries and of the chase, and who as yet were strangers to all agriculture.

The shell-heaps are also frequently met with in California, and some districts near San Francisco are literally covered with them. One of them, situated near San Pablo (Contra



FIG. 16.—Stone mortar (California).

Costa County), is more than a mile long by half a mile wide. The shells of which it is made up, chiefly those of the oyster and the mussel, have all been subjected to the action of fire.¹ Excavations to a depth of twenty-five feet in a similar mound have yielded arrow-points and hammers. Among others have been found thousands of bone implements (fig. 15), the largest of which are eight inches long. Mixed with

¹Foster, "Prehistoric Races of the United States," p. 163. Bancroft, vol. IV., p. 709.

these tools lay human remains, which have unfortunately been dispersed without any benefit to science.¹

Dr. Yates sent a complete collection of the objects found by him in Alameda County to the Smithsonian Institution at Washington.² It includes several large stone mortars (fig. 16), already alluded to, some implements chiefly intended for boring, pipes, and a rough representation of a phallus. This last fact must be noted, for we shall see that discoveries of this description are rare in America; this rarity contrasts strangely with the too frequent obscenities of Greek or Roman art.

The excavations in Oregon were directed by Paul Schumacher.³ He made an important collection of mortars,



FIG. 17.—Quartz scraper.

pipes of inferior workmanship, pieces of pottery, little cups of soapstone,⁴ daggers, knives, flint arrows, attempts at sculpture, and bone or shell implements. One of these excava-

¹ Bancroft, vol IV., p. 711.

² "Smithsonian Report," 1869, p. 36.

³ "Researches on the Kjökkenmöddings of the Coast of Oregon and in the Santa Barbara Islands and Adjacent Mainland."—"Bul. U. S. Geog. Survey," vol. III. "Report, Peabody Museum," 1878.

⁴ On the island of Santa Catalina Schumacher found a quarry of soapstone or steatite where the ancient inhabitants had set up a regular manufactory of pots and dishes. They are found in all stages of production, and about them may be picked up the tools used in fashioning them. Several similar discoveries in New England are mentioned. A steatite or soapstone quarry existed at Christiana, Lancaster County, Pennsylvania. More than 2,000 stone implements and a number of great stones, which seem to have served as hammers, have been collected there. The same process was employed as in the island of Santa Catalina; the stone was roughly hewn on the spot, then taken from the quarry and given to the workman who finished it off, giving it the required form.

tions brought to light thirty human skulls and two almost complete skeletons. The dead had been laid beneath the dwelling-place of the living.

Shell-heaps also abound on Vancouver Island, according to a manuscript quoted by Bancroft (vol. IV., pp. 737, 741, *et seq.*). Amongst heaps of shells have been collected hammers, arrow-points, wooden clubs, and a sort of knife carved out of whalebone. Amongst the debris lay skeletons. One of them had a shell bracelet on his arm, and a stone arrow-head was sticking in one of his bones. At Esquimalt a dish was found with two handles, one of them representing the figure of a man, the other the head of an animal. As we shall see, exactly similar articles are met with in the mounds of Central America. That of Esquimalt probably dates from the same period as the mounds with which the island abounds, some composed of pebbles, others of clay or sand. Huge flat stones, regular menhirs,¹ are often placed vertically on these mounds; venerable trees overshadow them, bearing witness to their antiquity. Newfoundland was discovered in 1491 by the Venetian, John Cabot, who commanded an expedition sent out at the expense of Henry VII. of England; perhaps, also, for that question is still undecided, by the Portuguese navigator, Cortereal. It is certain, however, that when it was discovered, the coast of the island appeared to be uninhabited. The numerous mounds alone attested the presence of man, and these mounds, with the stone implements they concealed, must therefore date from a period previous to the arrival of Europeans.

We must also mention the pits explored by Mr. F. W. Putnam² and others near Madisonville, in the Little Miami valley. These pits, which are from three to four feet in diameter and from four to seven feet deep, are filled with ashes arranged in thin layers and mixed with gravel and char-

¹ A Breton word signifying long stones, generally used to denote the tall upright stones erected, for some purpose not now known with certainty, by the ancient Celts.

² Putnam, one of the most eminent anthropologists of the United States, mentions having explored more than 400 of these pits.

coal. From top to bottom occur numerous bones of reptiles, fish, birds, and mammals. The bones of the deer, elk, and bear had been broken to get out the marrow; shells, too, chiefly fresh-water mussels of the genus *Unio*, were collected; some were pierced to serve as ornaments; with them were fragments of pottery, implements made of bone, the antlers of the deer and the elk, arrow-points, scrapers, hammers, polished stone axes, copper ornaments, beads, and stone pipes. At the bottom of one of these pits Dr. Metz found a large quantity of carbonized grains of corn, covered with corn husks and a matting of reeds, also carbonized. These bear witness to a people not only sedentary but agricultural.

The sambaquis are formed of the remains of the food of a people who for centuries inhabited the coasts of Brazil.¹ There, as in a book, we can read of the customs, usages, and incidents of the daily life of this extinct race. Each bed of shells² or of cinders is a page, on which facts written in stones and ashes speak for themselves, and where the drama of life is retraced by the broken bones of the victims. From a heap on the banks of the Suguassu River numerous human relics have been taken, the fractures in the bones showing clearly that they had been broken to get out the marrow. The cannibalism of these ancient inhabitants of Brazil need not surprise us, for at the present day there are in this empire, so advanced in many respects, no less than ten cannibal tribes, numbering altogether some 70,000 or 80,000 souls.³

The sambaquis often attain a considerable height. Captain Burton, who is, it is true, inclined to exaggerate, speaks of

¹ *Rev. Arch.*, vol. XV, 1st. series, Paris, 1867. Ch. Wiener: "Estudos sobre los sambaquis do sul do Brazil" (*Archivos de Museo Nacional de Rio de Janeiro*, vol. I., 1876).

² The mollusca of which they are composed are chiefly bivalve testacea, especially shells of the genus *Corbula*. Oyster and whelk shells are also met with.

³ Dr. Moure: "Les Indiens de la Province de Matto Grosso"; Dr. Rath de San Paulo: "Letter Addressed to the *Anglo-Brazilian Times*."

having seen one no less than one hundred feet high. One thing is certain, the shells forming these hillocks are so numerous that a single sambaqui has for more than two centuries not only supplied all the lime needed by the little neighboring town of Nostra-Senhora-da-Gloria, but yielded considerable quantities for exportation.

In the region of La Plata paraderos are met with somewhat resembling kitchen-middens. Both mark the sites of human dwellings, and the absence of all traces of disturbance excludes the idea of their having been cemeteries to which they were at first likened. Moreno and Zeballos have described those in several parts of Buenos Ayres; Ameghino in his turn describes those of the banks of the Marco-Diaz, the Lujan, and the Frias.¹

Numerous mammal bones are scattered about in certain places, often covering a considerable area.² The long bones are split, others show grooves and cuts; nearly all have been subjected to the action of fire. With these bones have been picked up stone implements, chiefly arrow-points (fig. 18) and fragments of clumsy and badly baked pottery, showing, however, traces of artificial coloration. Heaps of burnt earth and charcoal cinders tell clearly of the hearths of men. All the bones, whether of mammals or birds, are of species, such as the deer and llama, still extant in South America; nowhere are any bones found, such as those of frequent occurrence in the pampas formation, belonging to extinct animals. The paraderos must not therefore be confounded with those formations, and their much more modern character brings them near to that of the ordinary shell-heaps.

Recent discoveries³ have lately confirmed this conclusion. Excavations in a tumulus of elliptical form⁴ on the Parana

¹"La Antigüedad del Hombre en el Plata," vol. I., p. 302, etc.

²A paradero on the banks of the Marco-Diaz covers an area of 612 by 408 yards.

³Zeballos; "Un Tumulus pré-historique de Buenos Ayres" (*Rev. d'Anthrop.*, 1878, p. 577).

⁴The greatest diameter is 260 ft.; the smallest 105 feet. The height is about eight feet.

near the port of Campana, have brought to light a great many objects which bear witness to an advanced state of culture. There are weapons and tools of quartz or of blue granite, often of remarkable workmanship, hand-mills very like those still in use in the interior of Africa, implements of deer-horn,¹ whistles of venado wood, and above all a considerable number of fragments of pottery,² very superior in execution to any hitherto noticed. Some of these fragments are colored red, others are decorated with designs or ornamentation.

Among these pieces of pottery we must mention some very close imitations of animals, especially a parrot's head very true to life. The works of man lay mixed together in a



FIG. 18.—Arrow-points from the paraderos of Patagonia.

considerable accumulation of large pieces of charcoal, fish, and mammal bones. It is evident that this mound concealed one or more primitive hearths; and that these hearths, according to a custom that we meet with in many different races, became burial-places; the discovery of several human skeletons leaves no doubt on this point.

So far we have spoken only of the shell-heaps near the sea-coast, and formed of marine shells. Similar heaps are met with on the banks of streams and rivers, made of the shells of such fresh-water or even of terrestrial mollusca, as man might use for food. In Brazil, of which we are now speaking, there are sambaquis thirty-seven and a half miles

¹ *Cervus rufus* and *C. campestris*.

² Dr. Zeballos speaks of more than 3,000 fragments; among them he mentions twenty ollas or jars still intact.

from the coast, and Professor Hartt has described one at Taperinha,¹ near Santarem, which he considers very ancient, and which is entirely made up of river-shells, mixed with fragments of pottery, cinders, and the bones of different animals.

On the banks of the Mississippi and its tributaries White has also recognized shell-heaps, composed of fluviatile mollusks, nearly all belonging to the family of *Naiadæ*, and chiefly to the genus *Unio*. Complete success has rewarded his persevering researches in the states of Minnesota, Iowa, Illinois, Missouri, and Indiana.² The heaps excavated by him are much smaller than those situated on the sea-coast; the largest are not more than about one hundred yards long by four to five broad, and about three to six feet deep. That of Keosauqua (Iowa) rests on alluvial soil, and in it have been observed fragments of stone torn from the neighboring rocks, bearing traces of fire, and fragments of pottery of rude workmanship, mixed with large grains of sand and ornamented with lines traced with a pointed bone or stone. In this same shell-heap White collected flint-chips, arrow-points, and a serpentine hatchet, with numerous bones of the Virginia deer.³ They had been used as food by man, for the long bones which contain marrow had been split open, evidently for the sake of extracting it. In other heaps at Sabula and Bellevue, Iowa, White was able to make out the method employed by these men in cooking the shell-fish which formed their chief nourishment. They dug holes in the ground about one foot in diameter and of corresponding depth, in which they lighted fires. The charcoal, ashes, and shells found in each one of these holes proves this beyond a doubt.

¹ "Report, Peabody Museum," 1873, p. 21.

² "On Artificial Shell-heaps of Fresh-water Mollusks; Am. Association, Portland (Maine), 1873. Very ancient shell-heaps are also mentioned as existing in Tennessee, especially at Chattanooga, and at Mussel-Shoals. Colonel Whittlesey, whose name is an authority in America on all these questions, expressed regret a few years ago that these heaps had not been excavated.

³ In Appendix C. we give White's list of the chief mammals, fish, and mollusca which he found in the mounds he examined.

Jeffries Wyman describes the river shell-heaps of Florida with as much care as does White those of the North.¹ They are mostly mounds exactly similar to those of the coast, only entirely made up of fresh-water shells, associated with a few rare bones of the Virginian deer, the opossum, the raccoon, and some remains of birds. Some of these heaps also contain shells of *Ampullaria* and *Paludina*,² hardly suitable for food, and rejected with disdain by the present Indians. One of the most remarkable heaps is situated at Silver-Spring, on the western side of Lake George. It is the largest of those visited by Wyman, in the valley of the St. John's River. It covers an area of twenty acres; its height is very variable; here it rises to no less than twenty feet, there it sinks to two or three, in proportion doubtless to the number of the inhabitants and the length of their stay. It is difficult to understand how man can have collected such quantities of these mollusks, which now seem rare alike in the lake and the river. We must therefore suppose that they were much more numerous in past centuries, and have disappeared in the great struggle for existence which has been so fiercely maintained in every age and in every country. This is no exceptional instance; the oysters of gigantic size, the shells of which form the vast deposits on the Damariscotta River, of Maine, are now very rare, and the same fact has been observed at Cape Cod and Cotuit Port. Of the shells found in the Danish kitchen-midden, those of oysters were the most abundant, and they are now but very poorly represented in the Baltic. Another consequence of the less favorable biological conditions now enjoyed by the oyster is that it is diminished in size, and it is the same with the mollusks of Lake George and the St. John's River as with the oysters

¹ "Fresh-water Shell-heaps of the St. John River"; *American Naturalist*, Jan., 1862. "Report, Peabody Museum," 1874. Wyman remarks that the most ancient beds of the Florida kitchen-middens never contain specimens of pottery.

² Both are univalves. The former lives in warm latitudes only; its shell is globular, the whorls ventricose, and with a wide aperture bounded by an unreflected labrum. *Paludina* resembles *Ampullaria*, but the shell is longer and more slender, and generally more solid.

of Maine. It would be easy to multiply instances, proving the incessant struggle of nature, of which we are only now beginning to discern the traces.

The fact that the men who made these heaps of rubbish, which are now the sole witnesses to their existence, fed upon mollusks now rejected by the Indians themselves, so far from particular with regard to their food, is of a piece with the coarseness of their potteries. Wyman tells us that amongst the thousands of fragments he examined, none are of such skilful workmanship or of such elegant ornamentation as those of the mounds of Mississippi, or those he himself picked up in the sepulchres of Cedar Keys, or in the shell-heaps of Fernandina and of St. John's Bluff, on the sea-coast.

Every thing goes to prove that these men were in a low state of culture; we need not therefore wonder to find that they practised cannibalism. We have already noted its existence amongst the nomad tribes of Brazil;¹ as early as 1861, Jeffries Wyman noticed, in an excavation made on the shores of Lake Monroe, some long human bones (femur, tibia, humerus) broken into pieces a few inches long and mixed with bones of deer broken in exactly the same way.² His interest once aroused, he paid especial attention to this question in his later researches, and he had soon ten very characteristic examples, which left no doubt in his mind as to the existence of cannibalism in Florida, at the period during which man collected about his dwelling the heaps of rubbish to which we have applied the name of shell-heaps.

It is evident that the human bones did not come from a burying-place; no skeleton was complete; the remains of several individuals were mixed in the greatest confusion; all the bones, especially the long ones containing marrow, were broken like those found near Lake Monroe, and doubtless

¹ "Omnes cum magna voluptate vescuntur," says Osorio, of the natives of Brazil, speaking of their predilection for human flesh. *De Rebus Emmanuelis Regis Lusitaniae, Coloniae Agrippinae*, 1574.

² "Human Remains in the Shell-heaps of the St. John's River (East Florida); Cannibalism,"—"Report, Peabody Museum," vol. I., p. 26.

for the same reason as those of the animals, such as the deer or the alligator, which these people used as food. The interesting excavations at Osceola Mound have since confirmed Wyman's conjectures. The remains of men and animals were inclosed in very hard breccia, somewhat like that of the European caves which have yielded such important results. From this breccia Wyman extracted two femora, belonging to two different individuals; on one of them he noticed an incision made round the bone in order to break it more easily. On the other femur, the incision may have existed, but it is not sufficiently marked to be stated with certainty.

The learned professor also mentions a human bone found at Ipswich, Massachusetts, with evident marks of workmanship upon it.

While Jeffries Wyman was proving the existence of cannibalism in the southern states, Manly Hardy announced the same fact with regard to New England.¹ In a shell-heap on the coast of Maine he discovered thirty or forty long bones, the femur, tibia, humerus, radius, a sternum, a pelvis, and two human skulls. Among these remains there were literally no vertebræ, ribs or little bones; none of the human fragments corresponded with each other in such a manner as to make it possible to put together even part of the skeleton. The long bones were broken, and the excavations yielded bones of the beaver and the moose mixed with the human bones broken in the same way. There were also bird and fish-bones, numerous sea-shells, some fragments of pottery, a stone arrow and a bone needle. In many places heaps of cinders marked the hearth of the cannibal, where he had prepared his horrible meals.

Such facts, sad as they are for humanity, cannot surprise us. In historic times we find man feeding on human flesh, even in the midst of abundance, and that when most animals show a singular repugnance to eating the flesh of one of their own species. Herodotus² tells us of the cannibalism of

¹ "Report, Peabody Museum," 1877, vol. II., p. 197.

² Book IV., chap. XVIII., XXVI., etc. These people probably inhabited Central Russia.

several of the people in the neighboring countries of Scythia, amongst the Androphagi and the Issedonians, for instance. Aristotle relates it of several peoples on the borders of the Euxine.¹ Diodorus Siculus mentions it amongst the Galatians,² and Strabo, in his turn, speaking of the inhabitants of Ireland, says: "They are more savage than the Britons, feeding on human flesh, * * * and deeming it commendable to devour their deceased parents."³ In the ancient tombs of Asiatic Georgia, dating from the eighth to the second century, B. C., boiled or charred human bones are found, the remains, doubtless, of victims devoured by those who assisted in the feasts which formed an essential part of the funeral rites.⁴

St. Jerome, in the fourth century A. D., asserts that in Gaul he saw some Attacotes, descended from a savage Scotch tribe, who lived upon human flesh, notwithstanding they possessed great herds of swine, oxen, and sheep, to which their immense forests supplied excellent pasturage.⁵ How can we be surprised to find this degrading practice amongst savage tribes, when in the golden age of Rome the courtiers of the Emperor Commodus, according to Galen, ate human flesh in a refinement of gluttony,⁶ and though the Scandinavian kitchen-middens show no trace of cannibalism, Adam of Brenen, who lived in the eleventh century and

¹ "Treatise on Government," book VIII.

² "Biblical History," book V., chap. XXXII.

³ Strabo, "Geography," book IV., ch. V., pp. 298-9. (Hamilton's translation, 1854.)

⁴ Congress Arch. de Kazan, 1877.

⁵ "Quid loquar de ceteris nationibus, quum ipse adolescentulus in Gallia viderim Attacotos, gentem Britannicam, humanis vesci carnibus et quum per sylvas porcorum greges et armentorum pecudumque reperiunt, puerorum nates et feminarum papillas, solere abscindere, et has solas ciborum delicias arbitrari." Hier., Opera, vol. II., p. 335, coll. Migne, vol. XXII. Richard of Cirencester says that the Attacotes lived on the banks of the Clyde beyond the great wall of Hadrian.

⁶ Commodus lived from 161 to 192 A.D. We take this fact from Bachelet's "Dictionnaire des Sciences morales et politique." We might add these lines of Juvenal: " . . . Sed qui mordere cadaver sustinuit, nil unquam hac carne libentius edit." (Sat. XV., v., 87.)

preached Christianity at the Court of King Sven Ulfsen represents the Danes of his time as wearing the skins of beasts, hunting the aurochs¹ and the elk, imitating the cries of animals, and devouring their fellow-creatures.²

Examples also abound in America, and the death of the man to be eaten was very often accompanied by horrible tortures, unknown among the natives of the other continent. The accounts of travels published by Bry contain many details of the ways in which the savages of Guiana were accustomed to prepare, cook, and eat the bodies of their victims.³ In their first feeble effort to reach Peru by way of the Isthmus of Panama, in 1524, Pizarro and his companions one day entered an Indian village from which the terrified inhabitants fled precipitately at their approach, leaving the human flesh they were cooking before the fire.⁴ The Mexicans indulged in these hideous repasts on all their feast days. The captive was given up to the warrior who had made him prisoner, and the friends of the conqueror were invited to a joyful feast. It was not, says Prescott,⁵ the meal of starving wretches, but a refined banquet, prepared with all the art the Mexicans could bring to bear upon it. The allies of the Spaniards, after the siege of Mexico, ate the flesh of their enemies, and the besieged sacrificed in the honor of the god of war numerous victims, amongst whom Cortes often recognized one of his soldiers, from the whiteness of the skin. After the sacrifice the bodies were cut up, and the flesh distributed to the people.

The Caribs, like the Fijians, were careful to fatten the

¹ The *Bos Urus* or Bison of Poland.

² *Schweden's Urgeschichte*, p. 341.

³ "Collectiones peregrinationum in Indiam Occidentalem," XXV., partes comprehensæ à Th. de Bry et à M. Merian publicatæ, Francofurti ad Mœnum, 1590, 1634. "Bresil voy. de J. Stadius Hesous," (Part III., pp. 71, 81, 89, 125 and 127). "Voyage de Joannes Lerus de Burgundus," part 3, p. 213. See also the numerous facts collected by Wyman, "Report, Peabody Museum," 1864.

⁴ Prescott: "History of the Conquest of Peru," p. 96, 1854.

⁵ Prescott: "Hist. of the Conquest of Mexico," Philadelphia, 1874, vol. I., p. 31.

unfortunate victims they meant to eat.¹ Cannibalism existed amongst the Algonquins, Iroquois, the Maumis, the Kickapoos, and many other tribes, and the Jesuits, who were often witnesses of the feasts in which human flesh was the only food supplied, have handed down to us an account of them.² One shudders with horror at the tortures invented by the ingenuity of man. Among some Indian tribes these tortures began several days before the final sacrifice. Lighted firebrands were applied to every part of the body; the nails of the fingers and toes were wrenched off; the flesh was torn, and burning splinters plunged into the gaping wounds; the victim was scalped and burning coals applied to the spot. Women³ and children were not the least eager amongst the torturers, and when the sufferer at last expired, his breast was opened, and if he had died bravely the heart was taken out, cut in pieces, and distributed to the young warriors of the tribe. They also drank the still smoking blood, hoping to inoculate themselves with the courage of which they had just had proof. The trunk, limbs, and head were roasted or boiled; all gorged themselves with the horrible food, and the day ended with dances and song which gayly finished off the feast.⁴

In our own day, even, sailors and travellers have told of similar scenes. The Apaches, to a very recent date, were accustomed to treat their prisoners with a ferocity equal to that of their ancestors. The inhabitants of Terra del Fuego have at least as an excuse the wretched existence they lead, in a country almost destitute of all the neces-

¹ Peter Martyr d'Anghiera: "De Rebus Oceanicis et Orbe Novo, Decades, I., Book I.

² P. Hennepin: "Description de la Louisiane," Paris, 1683, pp. 65, 68, and 69.

³ "On this occasion it is always observed that the women are more cruel than the men." Schoolcraft: "Ethnological Researches Respecting the Red Men of America," vol. III., p. 189.

⁴ La Pothier: "Histoire de l'Amerique," Paris, 1723, p. 23. Father Jean de Brebeuf: "Voyage dans la nouvelle France occidentale." He himself perished under such tortures as those he had described. Barth. de Vimont's "Relation," Paris, 1642, p. 46.

saries of life. The expeditions of these miserable savages, of which Captain Fitzroy's description¹ is most melancholy reading, were always made for the sake of getting prisoners; when they failed, and hunger became pressing, the old women of the tribe were seized, roasted at a roaring fire, and pieces of the flesh distributed to the warriors. Of late years, however, a better state of things has prevailed in those desolate regions, brought about by the visits of various expeditions, and the presence among them of devoted missionaries. But if the famine which bears so hardly on the Fuegians nearly every year may be referred to as an excuse for their cannibalism, we nevertheless find this practice has prevailed in regions of plenty, amongst the most luxuriant vegetation of the tropics. Humboldt saw similar scenes on the banks of the Orinoco; at Tahiti even, where the gentle and affectionate manners of the inhabitants have been frequently noted by travellers, the sacrifice of prisoners was followed by cannibal feasts; the honor of eating the eyes of the victims being reserved to the king. The first name of Queen Pomare (*Aimata, I eat the eye*) is a last souvenir of the royal privilege.²

To conclude these melancholy accounts, which we might easily extend indefinitely, Dr. Crevaux, in a recent exploration of the Amazon and its chief tributaries, came upon several cannibal tribes. Amongst the Ouitotos, who live on the banks of the Yapure, he saw some flutes made of human bones, and he tells us that one day, having surprised an old woman in the act of preparing her dinner, he saw the grinning head of an Indian boiling in her kettle.

These facts form a striking contrast to our brilliant civilization, and to the progress of which we are so justly proud. They show in what degradation man may exist; what practices may be justified by custom and superstition; and what efforts must still be made to raise to a state of civilization so many miserable races. It is to be borne in mind, how-

¹ "Voyage of the Adventure and the Beagle," vol. II., p. 183 and 189.

² "Congr. Préh. de Paris," 1867, p. 161.

ever, that the practice of cannibalism in many cases was not a mere devotion to a diet of human flesh, but a rite of a religious character, the cannibal imagining that in eating the flesh he imbibed something of the strength and courage of his victim. The greater the endurance displayed under the tortures inflicted on a prisoner, the greater the advantage to accrue to his executioners when they should share amongst them his mangled body.

In regard to the age of the shell-heaps the day has not yet come for expressing a definite opinion. It is certain many of them are of great antiquity, and that additions continued to be made to some of them up to a very recent time.

Historians are generally silent about these heaps, which did not attract much attention until archæology began to take its place among the sciences. When the Indians were questioned about them they generally answered that they are very old, and are the work of people unknown to them or to their fathers.¹ As an exception to this rule, however, the Californians attribute a large shell-heap formed of mussel-shells and the bones of animals, on Point St. George, near San Francisco, to the Hohgates, the name they give to seven mythical strangers who arrived in the country from the sea, and who were the first to build and live in houses.² The Hohgates killed deer, sea-lions, and seals; they collected the mussels which were very abundant on the neighboring rocks, and the refuse of their meals became piled up about their homes. One day when fishing, they saw a gigantic seal; they managed to drive a harpoon into it, but the wounded animal fled seaward, dragging the boat rapidly with it toward the fathomless abysses of the Charekwin. At the moment when the Hohgates were about to be engulfed in the depths, where those go who are to endure eternal cold, the rope broke, the seal disappeared, and the boat was flung up into the air.

¹ It is the uniform testimony of those who have within recent years been in communication with the Seminoles, that no tradition of the origin of these heaps has come down to them. They attribute them to their predecessors in the occupation of the peninsula of Florida. See Wyman, "Report, Peabody Museum," 1868, p. 16.

² Bancroft, vol. III., p. 177.

Since then the Hohgates, changed into brilliant stars, return no more to earth, where the shell-heaps remain as witness of their former residence.

Though tradition is silent as to the kitchen-middens, a few facts exist which may help us if not to fix a definite age for them, at least to determine something of their limits. The shell-heaps existed long before the arrival of the Spaniards, and the mammals whose remains are found in them were of the same kind as those seen by the conquerors. No bones of large extinct animals have been found in the shell-heaps, either on the sea-coast or on the banks of rivers. So far no discovery has been made in those of North America of any iron, copper, or bronze implements, or of any gold or silver objects. It therefore seems natural to place their formation between the time of the disappearance of the latest tertiary fauna and the first introduction of metals by Europeans.

It is evident that they are the accumulations of many generations. The fresh-water shell-heaps, judging from those hitherto examined, appear to be more ancient than those formed near the sea, but were in localities less liable to denudation and change. The shell-heaps of California are quite recent, those of Florida perhaps less so; and even in neighboring districts the pieces of pottery, weapons, and implements found in different shell-heaps sometimes present notable differences, suggesting that they were not contemporaneous. Did the men who slowly piled up these shell-heaps belong to one race, or to races that successively occupied the same site? Without being able to say any thing positive on this point, it is an invariable law of history, that conquerors should occupy the dwellings of the conquered, until they were in their turn driven out by yet more powerful or braver invaders. The shell-heaps all over America greatly resemble each other; but there is nothing in this resemblance to surprise us; it is natural to the savage to throw out at the door of his hut and about its immediate vicinity, useless objects, rubbish of all kinds, without caring about the proximity of dirt. This is a common thing all the world

over. Travellers who visit the Eskimo of to-day, the last representatives of one of the most ancient American races,¹ tells us that about their tents the ground is strewn with all sorts of rubbish, emitting a most noisome odor. There we have a sufficiently exact picture of the manners and customs of most of the savages who inhabited America in pre-historic times.

Amongst these heaps, some, those of Santa Rosa for instance, bear evidence that those who formed them devoted themselves to the chase, wearing the skins of the animals they killed; numerous bone needles giving proof of their industry. Amongst the neighboring middens of Bear Point, only sea-shells are found; no sign of the bones of animals, no bone implements. Must we then conclude that the people who made them were different, or that their clothes were made of grass or of fibres from the bark of trees? as were those of the natives of Florida, according to the Spanish conquerors, who were the first to penetrate into the country.

This is not at all necessary. These natives were migratory with the seasons, and, judging by the practice of the Eskimo, probably limited their pursuits in accordance with their superstitions; at one season they resided at a certain spot, hunted the seal, but perhaps like the Eskimo did no sewing while the hunt was going on. At another season, as in winter, retiring to some sheltered cove they might have subsisted chiefly on mollusks, and occupied their time in making clothing, carving wooden or bone utensils, etc. Then the contents of the two resulting middens would be quite different, though made by the same people at the same period of their history.

Differences are often noticeable in the pottery. The vases

¹ It is interesting to note the resemblance in primitive times between the Eskimo and the inhabitants of the Aleutian Islands. The weapons, tools, and implements yielded in excavations are identical. The difference in the fauna and the climate gradually modified the customs of the two branches of one people, as separation did their language. W. H. Dall, "Remains of Later Pre-historic Man from the Caves of the Catherina Archipelago, Alaska Territory." "Smith. Cont.," No. 318, 4^o, 1878.

in one case are elegant in form and ornamentation; the handles represent the figures of animals and of men, they resemble in many respects those found in the mounds of the interior. In other cases, on the contrary, the pottery is badly baked and of coarse construction. In certain regions, suitable stone is rare, and pointed bones seem to have served for defensive weapons and all domestic requirements. As a general rule, excavations in the Atlantic shell-heaps have not produced either a single pipe or a fragment that could have belonged to one, so that the fashion of smoking, of which we shall notice so many traces, probably came in later. On the other hand we find ornaments almost everywhere, and often pieces of red chalk or hæmatite, doubtless to be used in coloring wood or skins. The taste for finery is innate in man even when most miserable and degraded, and his taste sometimes astonishes us with the strange form it assumes. In the vast regions where the accumulations we are describing have been found, the differences must necessarily be very considerable. No general conclusions or final theories are possible; for if one point seems proved, many others are uncertain or even contradictory.

One method has frequently been adopted in forming an approximate idea of the date of the formation of certain shell-heaps. There are some which are covered with gigantic trees. That of Silver-Spring is crowded with venerable oaks; one of the largest of them measures no less than twenty-six to twenty-seven feet in circumference, so that, according to Jeffries Wyman,¹ it cannot be less than six hundred years old. Judging from their concentric rings, he estimates the age of the trees on the shell-heaps of Blue-Spring and Old Town at four hundred years. If these calculations could be considered to be exact, they would enable us to ascertain satisfactorily the time when the shell-heap was abandoned, and the forest tree replaced the dwelling of man; but even then our ignorance would remain complete as to the initial date when the accumulation of shell and rubbish began, and it is this which it is above all important to know.

¹ "Report, Peabody Museum," 1872, vol. I., p. 25.

Moreover, recent observations of botanists show that, especially in warm regions, the concentric rings of growth in trees by no means accord with successive years; more than fifty rings having been observed in a tree only fourteen years old on one occasion. They are entirely untrustworthy as a measure of chronology.

The deposits of guano in Peru have yielded fish (fig. 19), little figures, clumsy gold and silver images, and numerous fragments of pottery. The Peabody Museum at Cambridge, Mass., owns twenty gold ornaments from the Chincha Islands.¹ These consist of very thin metal plates arranged in parallelograms from seven to eight inches long by three to four wide, covered with dotted lines and pierced with a hole, by means of which they can be hung round the neck or fastened to the clothes. Man then inhabited these islands when the beds which have played such an important part in our modern



FIG. 19.—Silver fish from the Chincha Islands.

agriculture were accumulating, and doubtless fed upon the numerous sea-birds peopling them. In some parts the beds are covered with marine deposits, sometimes attaining a depth of six feet. A geological survey of the district indicates that since they were visited by man, these islands have been submerged beneath the waves and have emerged from them again; but the causes of these phenomena are yet unknown. According to all appearance these deposits belong to the same periods as the shell-heaps above described; the occurrence of precious metals, such as gold and silver might, indeed indicate a more recent epoch, but we know that they

¹ "Report, Peabody Museum," 1874, p. 20.

were used at an earlier date in Peru than in North or Central America.

In quaternary times the Europeans inhabited natural caves or caves artificially enlarged, according to their requirements. These caves, especially those of the south of France and of Belgium, have yielded the most certain and most interesting proofs of the existence of pre-historic man, and of his habits and his daily life. In America, grottos seem to have been chiefly used as burial-places, during a period of time the limits of which it is impossible to fix. The earliest explorers¹ tell of caves in Virginia, Tennessee, and Kentucky, in which human bones were found. Others in California were, we are told, covered with admirably preserved drawings representing men or strange animals; they contained many mummies. Clavigero, who gives these details, adds that these men differed as much in their features as in the garments with which they were covered, from the races met with by the Spaniards. From a cave in the Rio Norzas valley, in the province of Durango, Mexico, a considerable number of mummies have been taken, of an appearance very distinct from the present inhabitants of the country. The objects deposited near the mummies were hatchets, stone arrow-points, and vases, the decoration of which has been fancied to resemble that of some Egyptian pottery.² The Spaniards could not contain their astonishment at the sight of the marvellous feather garments with which the bodies of the Incas of Peru were covered, in the caves which are described as forming their last resting-places. But nearly all these caves, if they ever really existed, have been lost sight of; or all they contained has disappeared, and we can not doubt the exaggeration which appears in most of the details given by the conquerors. The very few caves still known are extremely difficult to explore. Some, especially those met with in Mexico, in Chihuahua, or California, were sepulchres, and retained no traces of previous habitation; others

¹ Conant: "Footprints of Vanished Races," ch. VI.

² Proc. Anthropological Soc. of Washington, 1879, p. 80.

had been occupied by Indians, as dwellings or places of refuge,¹ and all the objects that explorers have been able to collect are of recent origin.

Amongst the caves which may be of some interest, we will name those in the calcareous cliffs overlooking the Gasconade River. One of the most remarkable is in Pulaski county, Missouri. It was originally formed in geological times, and afterward artificially enlarged by man; its entrance is rather difficult of access, being perpendicular to the river. Conant had a trench made 175 feet long without reaching the limits of the successive deposits. We give a list of the beds as they occur, with their depth:

A. Alluvium mixed with cinders and fragments	18 ins.
B. Cinders	2 "
C. Clay	2½ "
D. Cinders	½ "
E. Alluvium	3 "
F. Clay and cinders mixed	3 "
G. Cinders	½ "
H. Alluvium	3½ "
J. Cinders mixed with charcoal	4 "
K. Alluvium	7 "
L. Cinders	3 "
M. Alluvium mixed with fragments of charcoal	20 "
Total	67 ins.

The strata must have been frequently disturbed. They consist of earth and cinders mixed with fragments of pottery and charcoal, stone implements, broken human bones, and a great number of bone or shell tools of various forms, rather roughly made (fig. 20). The original soil consisted of a reddish clay, where were picked up numerous shells of *Unios* completely decomposed. Similar shells occur in positively prodigious quantities in the various strata. At a depth of about two feet the explorers came to a skeleton

¹ Schoolcraft: "Archives of Aboriginal Knowledge," vol. IV., p. 217. "The Navajos," says Gallatin, "inhabited caves in which they kept their crops." "Nouv. Ann. des Voyages," vol. CXXXI., 1857.

lying on its back, then to a second doubled up, a little further to that of a very old woman. All were in such an advanced state of decay that only a few fragments could be preserved, and those were of no use for comparison. Round about the skeletons were strewn great quantities of the bones of deer, bears, mud-turtles, and wild turkeys. The skulls of all the animals were broken; the brains were evidently considered a dainty. This was undoubtedly a cave long inhabited by man; burial in it was an accidental feature, unless these bodies may have been intentionally interred near their own hearth. We lean to the latter opinion, for this was a custom dear to the heart of many savage people.

Shelter cave, near Elyria, Lorain county, Ohio, must also have served as a shelter to early inhabitants of the country.



FIG. 20.—Bone implements from the Gasconade River.

At a depth of four feet the difficulties became so great that the excavations could not be proceeded with. At this point the soil formed a compact breccia, in which were imbedded the bones of the bear, wolf, elk, rabbit, and squirrel, among which could be made out three human skeletons, probably those of men who had been crushed, in the shelter they had chosen, by the fall of part of the roof. The skulls, which were in a good state of preservation, were exhibited in Cincinnati, in 1851, at the meeting of the American Association for the Advancement of Science. They were unfortunately destroyed a few years afterward, together with the museum of the Homœopathic College in which they had been placed, and we have no information enabling us to describe them. One of the most distinguished archaeologists of the United States—Colonel Whittlesey—attributes a great

antiquity¹ to these remains, but his estimate is too hypothetical to be worth discussing.

Ash Cave in Benton county, Ohio, is one of these rock-shelters, so common in the south of France, and is remarkable for a considerable deposit of cinders covering an area of one hundred feet long by an average breadth of eighty feet. A trench two and one half feet deep revealed a considerable mass of *débris* of all kinds, bones of animals such as were suitable for the food of man, little sticks which may have been used as shafts for arrows, fragments of pottery, nuts, and grass fibres. A skeleton was seated near the wall, and the pieces of bark with which he had been covered, doubtless to keep the cinders from touching him, could still be made out. The greatest precaution had also evidently been taken with regard to a packet of little seeds² placed near him, which had been carefully covered with a layer of grass and ferns, and then with some coarse tissue. We are ignorant alike of their purpose and of the rite with which they were connected. We can only add that Professor Andrews,³ from whom we have gleaned these details, considers the skeleton to date from a very remote period.

In June, 1878, a habitation was examined situated in Summit county, Ohio; it was formed by two rocks, each from fifteen to twenty feet in diameter, with a third rock forming a kind of roof. This dwelling, open though it was on the north and south, had served as a home for long generations, for after removing a thin layer of vegetable mould, the archaeologists who conducted the excavation met with beds of cinders four or five feet in thickness. Numerous boulders, that the troglodytes had not even had the energy to remove from their wretched residence, were imbedded amongst these cinders, together with more than five hun-

¹ "Judging from the appearances of the bones and the depth of the accumulation over them, two thousand years may have elapsed since these human skeletons were laid on the floor of the cave."—"Evidences of the Antiquity of Man in the U. S."

² *Chenopodium album*.

³ "Report, Peabody Museum," 1877, vol. II., p. 48.

dred fragments of pottery, bones, shells, and stone weapons or tools. The pottery retained the marks of the bark fibres of the netting in which it had been supported before baking. The deeper the excavations went the coarser and clumsier was the pottery. Not one of the stone objects showed the slightest trace of polishing, and most of them seem to have served as knives. The bones were those of the bear, wolf, porcupine, buffalo, stag, squirrel, fox, beaver, and there were some which had belonged to a heron and a wild turkey. The bones containing marrow had been broken, some were roughly pointed, all indicating that the culture of the cave men had been of the most primitive description.¹

In Pennsylvania, eighty-two miles from Philadelphia,² on the face of a cliff rising parallel to the Susquehanna River, a natural cave was found, some seven feet high, in a very hard quartzite, showing no trace of erosion either by the work of man or the action of water. The original soil consisted of yellow clay, and on this clay rested a bed of black mould, some thirty inches thick.³ The whole deposit was rich in human remains, and there were collected here more than four hundred arrow-points made of petrosilex, jasper, basalt, argillite, with rare examples in quartzite, which materials were easily accessible from the neighboring rocks. These arrows presented a great variety of forms, and were in every stage of manufacture. With them were found five perforated objects commonly called tomahawks, but too thin to have been used as a weapon or tool; some knives or fragments of knives, only the concave sides of which were polished, the convex side showing a groove and marks of having been struck sharply; some broken turtle bones, some

¹ Read, "Exploration of a Rock shelter, in Boston, Summit county, Ohio." — *American Antiquarian*, March, 1880.

² Haldeman: "A Rock Retreat in Pennsylvania," *Congrès des Américanistes*. Luxembourg, 1877, vol. II., p. 319.

³ "This mould," says Haldeman, "is of vegetable origin." Dr. Andrews (*American Naturalist*, February, 1876) says that it must have taken centuries to form ten inches of vegetable mould, but we have already pointed out how hypothetical such calculations always are.

Unio shells from the river, three hundred fragments of pottery, the tube of an earthenware pipe resembling those we shall describe in connection with the mound-builders, and lastly a pestle and some pieces of red or black ferruginous minerals, which these cave men had used to get the colors they required, traces of these colors still remaining on the pestle. The excavations yielded no bones that could be attributed to man. Those who used this shelter were not, therefore, cannibals, and they disposed of their dead away from their dwelling.

Some human bones have been picked up in a cave near Louisville, Kentucky. This cave, which is very large, has a remarkable declivity at the further end; it has been very imperfectly excavated, the numerous rattlesnakes having driven off the explorers. It has been ascertained however, that, as in the cave of Elyria, the bones were imbedded in a breccia formed by the lime-impregnated water which oozed from the roof. After a great deal of trouble the explorers succeeded in taking out six skulls almost intact, and with them a hatchet, a mortar, and a stone arrow-point. Colonel Whittlesey attributes to these skulls an antiquity no less remote than to those of Elyria.

The German traveller, Müller, tells of the existence, in the province of Oajaca, of some caves which had been used as human residences from a very ancient epoch; we must content ourselves with mentioning them, together with the discoveries made at High Rock Spring near Saratoga, New York, although since 1839 some archæologists have claimed for these, as first traces of the aboriginal American, a great antiquity.¹ We hasten to pass to better information published in an excellent report addressed in 1875 to the trustees of the Peabody Museum by Putnam.²

The learned professor noticed near Gregson's Springs, Kentucky, a rock-shelter resembling those we have mentioned. The rock had been hollowed out artificially and the

¹ Dr. Maguire : Proc. Boston Soc. of Natural History, vol. II., May, 1839.

² Report, Vol. I., p. 48, etc.

soil was strewn with the bones of animals, worked stone articles, and fragments of pottery and charcoal. This was but a beginning, and Putnam's persevering researches ought to lead to more important discoveries.¹

The cave known as Salt Cave may be compared to the celebrated Mammoth Cave. It consists like the latter of a great number of passages, which can be followed for miles. In one of the smaller or larger rooms to which these passages lead certain traces of the residence of man were recognized. These are the cinders of several hearths, or piles of stones built up with a cavity in the centre where, according to a plausible supposition, fagots of chips, or of reeds were placed to give light to the cave. In several places such fagots have been found tied together with fibres of bark.

In one little dwelling-place, at about three miles from the entrance to the cave, ² Putnam made out the footprints of a man shod with sandals, and a little further on he found the sandals themselves, made with great skill of interwoven reeds. The garments of the cave men were woven of the bark of young trees; some black stripes traced on a piece of cloth so prepared, and fragments of fringe also found in the cave, bore witness to their taste for dress; another piece of stuff curiously mended gave proof of their industry. Remains were also picked up of gourds, often of considerable size, and two finely worked arrow-points. The ground was covered with human excrement, the analyses of which suggest that the inhabitants of the cave were vegetarians, but excavations have only yielded a few fresh-water mussel-shells almost entirely decomposed. The discovery of sandals, woven stuffs, the absence of the bones

¹ We will merely recall several caves, such as those called *Saunders' Cave*, the *Haunted Cave*, and one situated in Hart County. Although frequent excavations and disturbances make all surmises problematical, the probability is that these caves were never used for human habitation, but were only used as graves.

² We follow Putnam's account: the distance he gives appears very great, unless we suppose the existence of another entrance not yet known.

of animals, and the long habitation of the cave suggest a sedentary population devoted to agriculture, and no longer depending exclusively for food upon hunting and fishing.

Putnam adds an important remark. A mummy was found in 1813 in Short's Cave,¹ and deposited in the Museum of Worcester, Massachusetts; a careful comparison between the clothes it wore and the fragments found at Salt Cave allow us to class them as identical in character. Here then we have a people that buried their dead with care, and whose habitat extended over a large area. Putnam adds that certain details of the burial point to the great antiquity of the mummy found in Short's Cave; adding that these cave-men presented every appearance of a culture very much above that of the savages to whom the shell-heaps bear witness, and they probably date from a less remote antiquity.

When caves were not at hand, when these primeval Americans saw before them nothing but vast bare plains, shelterless prairies, impenetrable forest, haunted by wild animals, these first Americans, like the men met with by the Spaniards, and like those who still wander in the deserts of Arizona or of New Mexico, probably inhabited wigwams, put together in a few hours (fig. 21) and destroyed no less rapidly, when the nomad habits of their owners or the pursuit of game led them to a distance. Colonel McKee, who was one of the first to reach California when the country was first occupied by the United States government, tells us that at the approach of summer the tribes of the Northwest burnt their skins or reed huts in which they had spent the winter, so as to destroy the vermin with which they swarmed. Most of the men of these tribes went about nearly naked; the women and the girls of marriageable age wore only a little petticoat reaching from the waist to the knees, the bosom remaining uncovered at every age.

The arrangement of the hut doubtless varied, as it does

¹Short's Cave is eight miles from Mammoth Cave, which is often wrongly cited as the scene of the discovery of this mummy.



FIG. 21, Indian camp.

now, among the different races and tribes. The Comanches set upright the poles which were to keep the tent in position; the Lipans and Navajos¹ tied them in a conical form; the Apaches arranged them in an elliptical oval.² Each tribe had its own special form of wigwam, transmitted from its ancestors, and, perpetuated by custom, they remained permanently characteristic. Even now, when an abandoned camp is met with, the tribe it belonged to can often be easily ascertained by an examination of the huts. The poles were sometimes covered with branches or with skins, sometimes with grass or flat stones. The huts were from twelve to eighteen feet in diameter, by four to eight feet high. Sometimes the ground was hollowed out, so as to give the family a little more room. A triangular opening closed with a strip of cloth or of skin, completed the dwelling. Other tribes contented themselves with digging a hole in the earth and covering it with branches. Some of the Indians of New Mexico were still more savage. Naked and horribly dirty, they wandered during the great heat of the summer near the water-courses, taking temporary shelter now in a ravine, now in a cave, a precarious refuge, and for which they had to dispute possession with wild beasts. In winter they built up a circular wall, about two feet high, with stones and branches of trees. This wretched dwelling could never be closed, a roof of any kind being contrary to their superstitious notions, and there huddled together they tried to protect themselves from the extremes of cold.³ The dwellings of the people inhabiting the central districts of Mexico consisted of a few poles, bound together with creepers of vigorous growth native to the tropics, and covered in with palm leaves. In the colder mountain regions

¹ James Simpson: "Journal of a Military Reconnaissance from Santa Fe to the Navajo Country," Philadelphia, 1852.

² Bartlett: "Personal Narrative of Exploration and Incidents in Texas, New Mexico, California, Sonora, and Chihuahua," New York, 1854.

³ Venegas: "Noticia de la California y desu Conquista," Madrid, 1757: "Le abitazione le piu comuni sono certe chiuse circolari di sassi schiolti ed amucchiati, le quali hanno cinque piedi di diametro e meno di due d'altezza." Clavigero, "St. del la California," vol. I., p. 119, Venezia, 1789.

the walls were formed of the trunks, firmly bound together with cane, and covered inside and out with a thick coating of clay.

Such were some of the tribes met with by the conquerors, and such doubtless had they been for many generations before the arrival of the Spaniards. Side by side with them lived others more interesting to the historian and the philosopher, and of these it is now time to speak. The mystery in which they are shrouded adds to the fascination exerted by a mere view of the ruins bearing witness to their presence in the past.

CHAPTER III.

THE MOUND BUILDERS.

The existence of artificial mounds in the valleys of the Mississippi, the Ohio, and the Missouri, with those formed by their tributaries, escaped the notice of the first pioneers in America, who were altogether absorbed with the search for valuable booty. Garcilasso de Vega¹ and the anonymous chronicler of the unfortunate expedition of Hernandez de Soto² make, it is true, some allusion to them; but it was not until many years later, when a regular trade was established with the Indians³ living beyond the Alleghany Mountains, that any exact information was obtained with regard to these rude but imposing monuments—sole witness of a life and customs which remain almost unknown.

Carver in 1776 and Harte in 1791, were the first to take any special notice of these mounds; Breckenridge, who wrote of them in 1814,⁴ tells us that they astonished him as much as did the monuments of Egypt; and later Messrs. Squier and Davis checked earlier accounts by the more exact methods of

¹ "History of Florida," published at Lisbon in 1605, at Madrid in 1723, and translated several times into other languages.

² "Velacão verdadeira dos trabalhos que ho governador don Fernando de Soto et certos fidalgos Portuguesos passaraono descobrimento da provincia da Florida," translated into French and published in Paris in 1685; translated into English and published for the Hakluyt Society in 1851. Consult also, in the Ternaux collection, the account given by the chaplain of this expedition, which took place in 1539.

The Grenville collection in the British Museum has a rare copy of the first edition of this work. It is a small octavo in black letter.

³ They themselves had given to the Yazoo the characteristic name of *River of the Ancient Ruins*, on account of the mounds in its vicinity.

⁴ "Views of Louisiana," Pittsburgh, 1814.

modern science. Between 1845 and 1847, more than two hundred mounds were excavated by them, and the description they give, published by the Smithsonian Institution, is still our best guide with regard to these remains.¹ This publication gave a fresh impulse to investigations. Expeditions undertaken on every side and carried out with zeal, resulted in the finding of the most diverse and curious objects. Most interesting monographs and careful studies were published after the expeditions, and it is our task to make known the results of both.

The mounds are artificial hillocks of earth, nearly always constructed with a good deal of precision. They are of various forms, round, oval, square, more rarely polygonal or triangular. Their height varies from a few inches to more than ninety feet,² and their diameter from three to about a thousand feet. Those supposed to be intended for the performance of religious rites end in a platform, which is reached by a skilfully planned flight of steps; none of these however are known north of Mexico; others can be climbed with difficulty. Some rise from the summit of a hill, others stretch away irregularly in the plains, often for a distance of several miles; others again we find symmetrically arranged and enclosed within walls, built of earth, as are the mounds themselves. All those of the United States, however, whatever their form or size, present very remarkable analogies with each other, and evidently belonged to men in about the same stage of culture, submitting to similar influences and actuated by similar motives. We find these mounds in the valleys³ already mentioned, and in those of Wyoming; of the rivers Susque-

¹ "Ancient Monuments of the Mississippi Valley." *Smith. Cont. to Knowledge*, Philadelphia, 1847, vol. I. *Arch. Americana*, vol. I.

² Dr. Habel ("Smithsonian Contributions," vol. XXII.) mentions a conical mound 300 or 400 feet high near Quito, but grave doubts are entertained as to its origin and artificial character.

³ According to Dr. Foster's calculations, the Mississippi Valley includes an area of 2,455,000 square miles, measuring 30° longitude by 23° latitude.

"Mississippi Valley," Chicago, 1869, p. 31.

hanna, Yazoo, and Tennessee; on the banks of Lake Ontario as far as the St. Lawrence; in the western districts of the state of New York; in the states of Missouri, Mississippi, Michigan, Wisconsin, Iowa, Nebraska, and Louisiana; the valleys of the Arkansas and of the Red River. Near Carthage, Alabama, a remarkable group of truncated mounds is described, surrounded by embankments which are gradually disappearing beneath the plough. In the South, however, the mounds appear to be less ancient than on the Ohio and Mississippi; as if the builders had been gradually driven back by an invading enemy from the North.

Similar tumuli stretch all along the coast of the Gulf of Mexico, from Florida to Texas. In the latter state and in South Carolina, especially, occur conical mounds, forming a transition in shape between this kind of structure and the *teocallis*¹ of Mexico, in which a temple crowns a truncated pyramid, in this case built of stone.² In Yucatan and Chiapas, artificial mounds form the foundation of some remarkable monuments that we shall have to describe, and which were already old at the time of the Spanish Conquest.³ Wells relates that in Honduras, even in the forests through which a path must be cut axe in hand, the Baqueanos⁴ find

¹ The Mexicans acknowledged a God, *Teut* or *Theot*; hence the name of *Teocallis*, the house of God.

² Brasseur de Bourbourg speaks of a great number of tumuli in the province of Vera Paz, presenting, he says, a striking resemblance to those of the Mississippi Valley. They are of reddish earth, and the Indians call them *Cakhay*, or the red houses ("Histoire des Nations civilisées," t. I., p. 15).

³ The whole central region is strewn with mounds bearing ruined buildings (Bancroft, vol. IV., p. 200). Such artificial mounds are met with at Uxmal, Nohpat, Kabah, and Iabnah. The Mayas always raised a mound as a foundation for their buildings; if a natural eminence existed, they took pains to enlarge it. Near the port of Silan two mounds are described on which are seen extensive ruins (Stephens: "Incidents of Travel in Yucatan," New York, 1858, vol. II., p. 427). Close to the Rio Layarto are two pyramids, on the summit of which now grow lofty tufts of trees (Baril, "La Mexique," Douai, 1862, p. 129). Monte Cuyo, near Yalahao, which is visible far out at sea, was spoken of even by the old navigator Dampier as the work of man.

⁴ Wells called them *Vaqueros*, and on his authority we had used that name; but from a communication that Mr. Ch. Barbier has been good enough to

mounds often of remarkable height. Each of these mounds yielded pieces of pottery, clumsy in construction, but of curious shape and ornamentation. Mounds are said to occur on the shores of the Great Salt Lake, in Utah, and in Arizona. They also occur, though of smaller dimensions, in California and Oregon, in the valleys formed by the Colorado and its tributaries, and Taylor pretends to have counted them by thousands from an eminence overlooking the Merced River. Their number diminishes as the Atlantic Ocean is approached. Rare beyond the Rocky Mountains, they are still more so in British America.

The number, form, and disposition of these mounds, often so strange in their design, so original in their execution, with the objects brought to light by excavations, are, we repeat, characteristic, and such as forbid their being classed indiscriminately with the burial mounds common to all parts of the world. It is amongst these latter that we must class the mounds travellers tell of in British Columbia, Vancouver Island, Peru, Brazil, and the pampas of Patagonia. Father Acuña tells of countless tumuli in the Terraba plains of Costa Rica, the centre of a once numerous population.¹ Other tumuli, no less numerous, bear witness to ancient history in the desert stretching all along the Mosquito coast of Central America.² Near the Balize River³ mounds raised in honor of the dead and surrounded with circles of stones recall the cromlechs⁴ of the old world. Lastly, Dr. Zeballos gives us a description of a tumulus near Campana,

address to us we learn that the Vaqueros, rulers of the vast herds of the country, do not make these researches. They may far more reasonably be attributed to the Baqueanos, who served as guides to the explorers.

¹ *Harper's Magazine*, vol. XX., p. 319.

² Boyle, "A Ride Across the Continent," vol. I., p. 296.

³ G. Henderson: "An Account of the British Settlement of Honduras," London, 1811. Frobel: "Seven Years' Travel in Central America," London, 1859.

⁴ A cromlech is the name given by archaeologists to a heap composed of two or more upright stones with a flat stone laid across them, marking a tomb. Cromlechs are to be met with throughout the British Isles, in France, and other European countries, and in some parts of Asia and America.

Buenos Ayres,¹ which is over six feet high and measures about two hundred and sixty feet long and one hundred and fifteen feet across. Excavations resulted in the discovery of twenty-seven skeletons; round about them lay arrow-points, stone hatchets, stones for slings, and a considerable quantity of bones of animals and fragments of pottery.

In other places explorers tell of piles of stones. These piles may probably date from much more recent periods, for even in our own day the Indians have a custom of adding a stone when they pass near the spots which tradition has long pointed out as the burial-places of ancient chiefs, or for some other reason. It is in this way that the Ozark hills have become covered with cairns or murgers.² They were looked upon as posts of observation, but their number alone is enough to confute this hypothesis, and excavations have often yielded human bones, leaving no doubt as to the real purpose of some of the mounds.³

We meet with such cairns again in Honduras, near San Salvador. Three miles from Toolesborough, Iowa, there are mounds actually built of granite boulders taken from the bed of the river. But it is in their style of construction alone that they differ from other mounds; in them also excavations have brought to light charcoal, worked stone, and the charred bones of animals.

In several states of the far West the mounds represent mammals, birds, and reptiles; indeed some bold architects have not hesitated to attempt to imitate the human body.

Ohio appears to have been one of the centres of mound-building. It is true that we meet with fewer mounds of strange form, but their total number is considerable. It cannot be estimated at less than 10,000, of which 1,500 are enclosed, and it has been calculated that the total length of all the mounds raised by man in this one State would be no less

¹ *Rev. d' Anthropologie*, 1879.

² Habel: "Investigations in Central and South America," *Smithsonian Contributions*, vol. XXII.

³ *American Antiquarian*, July, 1879, p. 59.

than 306 miles.¹ The whole of Missouri, especially the south-east portion known as the Swamp region² is also covered with countless tumuli, often grouped with evident design. In the state of New York, there are 250 enclosures resembling our modern fortifications.³ In an area of fifty miles, on the borders of the states of Iowa and Illinois, 2,500 mounds have been made out without counting earthen inclosures.⁴ Everywhere a much greater number than this have been destroyed by colonists and farmers, caring little in their hard struggle for existence for those who preceded them. Others, lost in vast deserts or in the impenetrable forests covering a considerable area in the two Americas, are still unknown to us.

The extent of the territory occupied by the builders of mounds in Central America, with the number of mounds erected by them, proves the great length of their existence. The importance of some of the works, which, according to the judgment of competent engineers, it would have taken several thousand of our workmen, provided with all the resources of our grand modern industries,⁵ months to execute, bears witness to an organized community and a powerful hierarchy. Lastly, the regularity of the buildings with the excellence of the execution of the objects found in them, prove to what an extent artistic feeling was developed amongst the makers of the mounds, whose existence has so unexpectedly been revealed to us by excavations.

It is with the relics of an unknown and remote past that

¹ Bancroft, vol. IV., p. 752. Pidgeon : "Ant. Researches," New York, 1858. Lewis & Clark : "Travels to the Source of the Missouri River," London, 1814.

² The Swamp region covers an area of 4,000 square miles, and includes six counties and portions of three others. The soil is formed of recent alluvium covering tertiary beds of gravel, clay, and marl filled with fossils. (W. P. Potter : "Arch. Remains in S. E. Missouri," St. Louis Acad. of Sciences, 1880.)

³ Squier : "Ant. of the State of New York," Buffalo, 1851, "Report, Peabody Museum," 1880, vol. II., p. 721.

⁴ *American Antiquarian*, July, 1879, p. 59 *et seq.*

⁵ The builders had no beasts of burden. These large structures were, therefore, built by man unaided.

we have to deal, and we will begin with the mounds; but the confusion in which the different forms they assume are mixed together, adds singularly to the difficulty of the task. Cones and pyramids are enclosed within a sort of breast-work; mounds supposed to be intended for the offering up of sacrifices are connected with tumuli; side by side with those representing animals rise polygonal or triangular mounds. Dr. Andrews' mentions in a plan of Athens county, Ohio, a collection of twenty-three mounds, seven of which, according to him, were intended as fortifications and sixteen as burial-places. The loftiest is 40 feet high



FIG. 22.—Triangular mounds.

by 170 in diameter.² In Pike county, Pennsylvania, a perfect square is to be seen enclosed within a circle constructed with no less regularity; at Portsmouth, four concentric circles intersected by wide avenues perfectly true to the cardinal points. The mounds near St. Louis formed three sides of a parallelogram about 328 yards long by 215 yards wide. The fourth side was shut in by three smaller mounds.³

¹ "Report, Peabody Museum," 1877.

² The content of this mound is estimated at 437,742 cubic feet, and as no signs of excavations are to be seen in the neighborhood, one can but suppose that this mass of earth was brought from a distance.

³ Breckenridge: "Views of Louisiana." St. Louis is sometimes called *Mound City* on account of the number of mounds which rise, or rather did rise, in its neighborhood.

According to De Hass, the mounds of Illinois form quite a town, a vast and mysterious series of monuments. He tells us that he was surprised to find nothing but sepulchres on the other side of the Mississippi, whereas everywhere else the groups of ruins were associated with walls of circumvallation. Conant¹ tells of a collection of mounds on the Root River, about twenty miles from its junction with the Mississippi (fig. 22). The chief mound measures twelve feet in height by thirty-six feet in diameter. It is situated in the centre of a circle, of which traces can still be made out. The ridges forming the three sides of the triangle are of equal length—144 feet; their diameter is twelve feet, and their height three, four, and five feet respectively. It is remarkable that these heights, taken together, equal the height of the central mound, and that when they are multiplied together the length of the sides of the triangle is obtained. This is doubtless an accidental coincidence, though several earthworks are mentioned of square or rectangular form, in which a similar relation is alleged to exist between the height and lengths of the mounds forming them.

As they have been subjected to vertical denudation for an uncounted number of years, it is certain that any numerical relations existing at present are different from those which originally characterized such mounds.

These facts will show how very difficult, not to say impossible, is any classification; we will, however, follow that of Squier; for, in spite of some too apparent inaccuracies, it has the advantage of simplifying our task and supplying an approximate grouping, each class of which will be successively taken up alterward. They are: 1, Defensive works; 2, Sacred enclosures; 3, Temples; 4, Altar mounds; 5, Sepulchral mounds; and 6, Mounds representing animals. Short ("North Americans," p. 81) gives a slightly different classification, as follows:

¹ "Footprints of Vanished Races," St. Louis, 1879, p. 30.

- | | | |
|---------------|---|-------------------------|
| I.—ENCLOSURES | { | For Defence. |
| | { | For Religious Purposes. |
| | { | Miscellaneous. |
| II.—MOUNDS | { | Of Sacrifice. |
| | { | For Temple-sites. |
| | { | Of Sepulchre. |
| | { | Of Observation. |

To these different lists perhaps may be added mounds built of adobes, or unburnt brick, which have crumbled to dust and are the remains of successive dwellings

The whole of the space separating the Alleghanies from the Rocky Mountains affords a succession of entrenched camps, fortifications generally made of earth. There were used ramparts, stockades, and trenches¹ near many eminences, and nearly every junction of two large rivers. These works bear witness to the intelligence of the race, which has so long been looked upon as completely barbarous and wild, and an actual system of defences in connection with each other can in some cases be made out, with observatories on adjacent heights, and concentric ridges of earth for the protection of the entrances. War was evidently an important subject of thought with the Mound Builders. All the defensive remains occur in the neighborhood of water-courses, and the best proof of the skill shown in the choice of sites is shown by the number of flourishing cities, such as Cincinnati, St. Louis, Newark, Portsmouth, Frankfort, New Madrid, and many others, which have risen in the same situations in modern times.²

¹ The ditch instead of skirting the rampart outside, and thus multiplying the obstacles in the way of an assailant, is generally placed inside. Professor Andrews quotes, however, an external moat at Lancaster (Fairfield County, Ohio), but he adds that it is an isolated example. "Report, Peabody Museum," 1877. If a stockade was placed on the rampart, the ditch would add an obstacle to attempts at digging a way in, while if placed outside it would facilitate such an attack.

² "The same places," says Dr. Lapham, speaking of the mounds of Wisconsin, "which were the seat of aboriginal population, are being now selected as the sites of embryo towns and villages by men of different race." "Smithsonian Contributions," vol. VII., p. 64.

Bourneville, twelve miles from Chillicothe, is one of the most curious fortified enclosures of Ohio. It occupies the summit of a steep hill; the walls—a rare enough instance—are of stone, built up without cement,¹ presenting a striking resemblance with the ancient pre-historic forts of Belgium and the north of France. The closing ridge measures more than two miles, and three entrances can still be made out, defended by mounds, which made access more difficult. In many parts, especially near the entrances, the walls seem to have been subjected to the action of a fierce fire, which has actually baked the surface. Basins artificially dug out supplied the inhabitants with the water they required. On part of the rampart grow gigantic trees, supposed to be of great age.

Round about these trees can be made out rotting trunks, the remains of earlier generations which have slowly perished after gaining their maturity. According to some archæologists, centuries have passed away since the forest usurped the place of the abode of man; others with more probability think these trees are less venerable than is generally supposed. In Wisconsin, says Dr. Lapham,² 54 to 130 years are required for a tree to increase one foot in diameter. Among those actually living very few exceed three or four feet in diameter. Lapham therefore concludes that they cannot date from much earlier than the sixteenth century, and they are probably considerably younger.

Fort Hill affords a still better example of these earth-works. This fortress, for such it may justly be called, rises from an eminence overlooking the little river of Paint Creek.

¹The Mound Builders used the materials at hand. When stones were abundant, they piled them up with earth to make their walls, but these stones are never quarried or dressed, nor are they ever cemented with any mortar; several instances may be quoted, notably a stone fort on the Duck River, near Manchester, Tennessee, in which the walls are of unworked stones, detached from neighboring rocks. At the entrance two mounds can be made out, which are supposed to have been posts of observation.

²"The Antiquities of Wisconsin," "Smith. Cont.," vol. VII. Southall, "Recent Origin of Man," p. 583.

The walls enclose an area of 111 acres. Above the stream, which formed a natural defence, they are hardly four feet high, but everywhere else the height is six feet, and they are some thirty-five feet thick. Several openings made entrance easy. One of them leads to an enclosure which was probably square, but its walls have been in a great measure destroyed; no trench or ditch protects them, and traces of a great fire can easily be discerned. In this second enclosure Squier places the dwellings of the inhabitants, built of unburnt bricks, or perhaps mere huts covered with grass,



FIG. 23.—Fort Hill, Ohio.

branches of trees, or the skins of animals killed in the chase. Within the fortifications can be distinguished two enclosures—one semicircular, the other circular. These were probably places sacred to the religious rites, or to the councils of the chiefs. All this is, however, mere conjecture; for the customs, ceremonies, and mode of government of these men can only be inferred from the very scanty historical data relating to tribes dwelling much further south.

One of the most curious works ¹ of this kind is situated in Clarke County, Ohio. It is a fort covering an area of only

¹ Cox, "A remarkable ancient stone fort in Clarke County, Ohio." *Am. Ass.*, Hartford, Connecticut, 1874.

eight or ten acres, and built at the top of a hill washed on the south by the Ohio, and on the north by a wide, deep stream, Fourteen Mile Creek, which flows into the Ohio, a short distance beyond. This hill, which is of conical form, rises 280 feet above the river, and on that side presents almost perpendicular walls, except at one point, where there is a pretty wide fault, the importance of defending which the builders of the fort were not slow to see. They protected it therefore with a wall, nowhere less than seventy-five feet high, built of rough stones arranged without mortar or cement of any kind. Inside, the traces can still be made out of a number of conical mounds and of a wide and deep ditch. These works must not be confounded with others situated in Ross county, and known under the name of Clark's Works. The latter include a parallelogram 275 feet by 177; and on the right of this parallelogram a square covering an area of sixteen acres.¹ The sides are eighty-two feet long, and in the middle of each of them an entrance can be made out, defended by a little mound. Inside, according to a custom to which we shall often have occasion to refer, rose several mounds of different sizes.

Many of these works are connected with each other with a skill which may well surprise us. Squier thinks he recognizes a continuous system of fortifications, arranged with great intelligence, stretching diagonally across the state of Ohio, from the sources of the Alleghany and of the Susquehanna in the state of New York to the Wabash River. Along the Big Harpeth River, Tennessee, earthworks are very numerous.² The line of the Great Miami River, one of the tributaries of the Ohio, is defended by three forts: one at its mouth, a second at Colerain, and a third at Hamilton. Beyond this last point other works extend for a distance of six miles along the river, protecting the tributaries of the

¹ The amount of earth used in making these earthworks is estimated at three millions of cubic feet. Whittlesey. "On the Weapons and Character of the Mound Builders," Boston Soc. of Natural History, vol. I., p. 473.

² Dr. Jones' "Explorations of the Aboriginal Remains of Tennessee," Smithsonian Contributions, vol. XXII., p. 4.

Great Miami on the north and west, or ranged in succession as far as Dayton and Piqua, so as to complete the line of defence. All these points are connected with each other by isolated mounds, mostly set upon hills commanding an extensive view.¹ These are supposed, with reason, to have been used as sentinel stations from which to watch the movements of the enemy or to transmit pre-arranged signals.²

Fort Ancient is forty-two miles from Cincinnati. Professor Locke, who was the first to describe it, estimates the quantity of earth used in its construction at over 628,000 cubic yards. It is built on the left bank of the Little Miami, 230 feet above the level of the stream, and forms behind the line of defences, to which we have referred, a central citadel. The length of the enclosing ridges is not less than three or four miles, and the walls, where they have resisted the ravages of time, are nearly twenty feet high. Hosea has lately repeated an observation often made, that the outline of these walls made a rough sketch of the continents of America. If this be so it can be but a purely accidental coincidence quite unworthy of any serious consideration. The Rev. S. D. Peet, taking up an entirely different point of view, sees in these outlines a struggle between two huge serpents,³ another flight of imagination difficult to follow. What is really of importance is the great amount of work done by the builders, and the skill they showed in their works of defence.

We must not omit to mention the ruins of Aztalan⁴ situated on an arm of the Rock River, Wisconsin. They

¹ The great Miamisburgh mound on the Ohio is one of the best examples we can cite. It is sixty-eight feet high and the circumference of the base is not less than 862 feet. (Short: "The North Americans of Antiquity," p. 52). Lookout Mountain, near Circleville, with its lofty mound, must have served the same purpose.

² Force: "A quelle Race appartenait les Mound Builders"; Cong. des Amer., Luxembourg, 1877, vol. I., p. 125. Rev. S. D. Peet: "The Military Architecture," *Am. antiq.*, Jan. 1881.

³ *American Antiquarian*, April, 1878, March, 1880.

⁴ *Milwaukee Advertiser*, 1837; *Silliman's American Journal of Science*, vol. XLIV.; Lapham: "Antiquities of Wisconsin," p. 41, plates, XXXIV. and XXXV.

were discovered in 1836 by Hyer, who gave them the name they bear in memory of an old tradition of the Mexicans, who make out that their ancestors came from Aztalan¹ in the North. The characteristic feature of these ruins is an enclosure of earthworks forming three sides of an irregular parallelogram, of which the rivers shut in the fourth side. They present considerable analogy to those of Ohio, but we do not find in them the regularity which is generally so striking in the latter. The angles are not right angles; the northern side is 600 feet long, the southern 684, while the western wall is more than double that length. The width of the walls is nearly twenty-five feet, but they have crumbled away to so great an extent that it is impossible to decide upon their original height. The present height varies from about one foot to three yards and a half.

We must note one rare and interesting peculiarity; the walls are reinforced at equal distances with projecting curves or bastions. Finally, at the southwest angle there are two little enclosures which we may if we like call outposts. All these walls were constructed of earth mixed with grass and rushes, and then subjected in various parts to great heat, doubtless with a view to strengthen their cohesive properties. This is probably the reason why various travellers have stated that the walls of Aztalan were built of brick. We can now affirm to the contrary.

In walking round the inside of the enclosure it is still easy to make out a considerable number of mounds. Some are truncated pyramids rising in successive tiers; others are tumuli. One of the latter has been excavated and two skeletons were brought to light. It was observed that the corpses had been placed in a sitting or doubled-up posture.

¹ The name of Aztalan is derived from two Mexican words: *Atl*, water, and *An*, near to. In Mexican traditions Aztalan, Culhuacan, and Aquilasco were the towns the people of Mexico inhabited before their migration in the direction of Anahuac. (Bancroft, vol. V., pp. 156, 305.) According to the Abbé Brasseur de Bourbourg, Aztalan is situated northwest of California. ("Hist. des Nat. Civilisées," vol. II., p. 292.) We may observe that nothing is more uncertain than such tradition.

The bones unfortunately crumbled to dust at the very moment of discovery, so that no satisfactory examination was possible.

Most archæologists consider Aztalan to have been a fortified post. Lapham alone remarks, and his observation is not without justice, that the situation of these buildings, overlooked as it is from every side, would in that case have been very badly chosen, and at complete variance with all the traditions of the builders. In any case, whether the ruins be those of a town or merely of a fortified enclosure, they must have been quickly abandoned, for excavations have yielded no remains proving the long residence of man.

Putnam, one of the most learned of American archæologists, describes¹ at Greenwood, near Lebanon, Tennessee, some earthworks forming a true fortification. He was able to make out the position of three entrances, and inside the enclosure numerous sepulchral tumuli and a lofty mound forming a truncated cone with very steep walls measuring fifteen feet high by one hundred and fifty feet in diameter at the base. At two different heights excavations have yielded calcined stones, cinders, and burnt bones, evident proofs of huge fires, either for offering sacrifices or for funeral rites. The dwellings of the men who made these earthworks must have been circular huts, of which some traces can still be made out. The burial-places were generally at a distance from the homes, but with touching sentiment the bodies of children were interred close to the hearths of their parents. Putnam considers the people of Greenwood to have been one of the most forward races inhabiting North America. They tilled the ground; they did not burn their dead as did the men of Ohio; their pottery and their ornaments are truly artistic, and we find amongst their relics copper from Lake Superior and marine shells. Seven perforated pearls were picked up in the grave of a child, so that trade was not unknown to them. All this speaks of progressing culture but not

¹ "Report, Peabody Museum," 1878, vol. II., p. 339.

of any thing beyond the standard of the modern Indian.

Sandy-Woods settlement,¹ Missouri, includes nine tumuli and a considerable number of circular excavations surrounded with walls and with an external trench. The present height of the walls varies from two feet to three and one half feet, and they are seven feet wide at the base. The trench is three feet at its deepest part, and seven feet wide. This trench communicates on the east with a marsh; so it has been supposed that it was intended to supply the inhabitants with the water they required, and that the wall was intended rather as a protection from inundations than as a defence against invaders.

The most important of the tumuli of which we have just spoken is of rectangular form. The northern and southern faces are two hundred and forty-six feet long, the eastern and western only one hundred and eighteen feet. The height is more than sixteen feet on the north, and nineteen feet on the south. The top forms a platform fairly easy of access, which measures one hundred and eight feet by fifty-one, which platform is covered by numerous fragments of badly baked clay, somewhat like bricks of coarse manufacture, and nearly all of them bearing impressions of grass or straw, mixed with the adobe before baking. Excavations of this mound yielded no results. Those in other mounds have been more fruitful, especially those in two circular mounds devoted to burial purposes, which must have contained from one to two hundred skeletons in each stratum. The first layer of skeletons was arranged on a level with the original soil, the second about a foot above it. They were so much decayed that an exact statement of their numbers cannot be made. Some of these skeletons had been doubled up, others were in a squatting posture, but the greater number lay stretched on their backs or stomachs, or lay on their sides. It has been remarked that the fact that the earth with which they were covered did not belong to the spot in

¹W. P. Potter: "Arch. Remains in S. E. Missouri." Saint Louis Acad. of Sciences, 1880.

which they were found, but must have been brought there from a distance (not necessarily great) bears witness to the respect shown by these men to their dead, and the importance they attached to funeral rites. Vessels and broken pieces of pottery placed near the corpses were numerous; from eight hundred to one thousand fragments have been collected.

As at Greenwood circular trenches marked the site of dwellings. They are about two feet deep by twenty-eight feet in diameter. The presence, in some particular spots, of heaps of burnt clay, cinders, fragments of charcoal, and the calcined bones of animals, indicate the hearths. They were generally in the centre of the habitation, and, as is the custom among numerous savage tribes, the smoke escaped through a hole made in the roof.

All the trenches of which we have just spoken were grouped irregularly within the enclosure. Every one chose the site that best suited his convenience, needs, or pleasure, and there erected his home.

On the branches of Little River are many settlements, in general resembling those we have just described. There is an elliptical mound surrounded by a wall and trench. This mound measures one hundred and ten by seventy feet. It is eleven feet high. Farther on in the Lewis Prairie rises the so-called Mound group where the traces of a double wall have been made out. A religious society utilized one of the mounds of Lewis Prairie on which to build a church, and at that time numerous bones appear to have been dispersed, so that Professor Swallow's later excavations were barren of results. In other places are mounds, banks sometimes of great length, intended to defend the approaches to a river or a spring, and excavations marking the sites of ancient habitations.

In fact, in many different places the earthworks of man have resisted time and preserved to the present day proofs of his existence.

If we leave the United States we may refer to a series of

trenches extending for several miles near Juigalpa in Nicaragua.¹ Their arrangement is peculiar (fig. 24). The general width varies from three to four yards, and at equal distances occur oval reservoirs, the axis of which reaches about twenty-six yards.

Two and four mounds occur alternately in each of these reservoirs. We are ignorant alike of the use of these works and of the people who executed them.

It was desirable to mention these trenches, which are different from any thing else of the kind reported from Central America. We shall not, however, multiply useless repetitions, and we will content ourselves with adding that if fortifications are less common southwest of the Missouri, they are numerous enough in Iowa, Wisconsin, and Indiana. In the last-named state and in Illinois their form is gen-



FIG. 24.—Trenches at Juigalpa, Nicaragua.

erally square, in Iowa and Missouri it is often triangular; but everywhere we notice great similarity in their structure and the occurrence of a central mound. On all the rivers which flow from the south and empty into Lake Erie or Ontario numerous forts are met with; but they are irregular, and enclose none of the mounds so characteristic of the others we have described.

The great amount of labor involved in the erection of their fortifications, bearing in mind the resources the builders had at their command, justifies us in looking upon the mounds as intended to be permanent, and probably, in case of the larger ones, as having been constructed by slow degrees. General Harrison, one of the early Presidents of the United States, was indeed justified in the opinion he expressed in speaking to the Historical Society of Ohio,²

¹ Boyle: "A Ride Across the Continent," vol. I., p. 212.

² Transactions Hist. Soc. of Ohio, vol. I., p. 263.

that these fortifications were not erected for a defence from a sudden invasion, for the height of the walls and the solidity of their construction show that the danger they were to guard against was ever present. General Harrison added: "The three mounds that I have examined, those of Marietta, Cincinnati, and that at the mouth of the Great Miami, particularly the latter, have a military character stamped upon them which cannot be mistaken. War and struggle have ever been the sad heritage of humanity, and the New World was not likely to be more exempt from them than the Old."

It is no less certain that similar works were far from uncommon among the Indians. They were described by all the earlier explorers, notably by the chronicler of De Soto's expedition, who saw them in the South actually occupied by the existing tribes. An early traveller tells us that he noted one general mode of fortification, which was a circumvallation formed of palisades from twelve to fifteen feet high, with openings through which the besieged could shoot their arrows. In 1855 an intrenchment was noticed erected on the banks of the Missouri, near Council Bluffs, by an Indian tribe, the Arikarees. This intrenchment, in accordance with a constant tradition of their race, was made of trunks of trees piled one upon the other.¹ Catlin describes a large Mandan village, in which the inhabitants were protected with palisades.² The forts attacked by Champlain in 1609 were defended by stakes driven into the ground and bound together with branches of trees and ropes made of bark fibre. Similar fortifications were always met with by the French in their long struggles with the Iroquois. There is little doubt that most of the encircling walls of the fortified enclosures of the mounds were surmounted by some sort of stockade, the remains of which have been occasionally noticed.

Some earthworks, occurring chiefly in the western states, have been thought to show from the mode of their con-

¹ Am. Ass., Worcester, Massachusetts, 1855.

² "Illustrations of the Manners, Customs, and Conditions of the North American Indians," London, 1866, 2 vols.

tion that they were not intended for defence. Forts were erected in places naturally indicated, often on heights but inaccessible. The enclosures, on the contrary, to which Squier and others wrongly give the title of sacred, are on the banks of rivers, in valleys overlooked by the neighboring hills, serious drawbacks which the Mound Builders considered in the erection of their purely defensive forts.

These enclosures, which were in all probability village defences, by whatever name we may call them, are always of regular form, square or circular, more rarely elliptical or polygonal. All the figures are perfect, all the angles are right angles, all the sides are equal. The men who built them certainly understood the art of measuring surfaces and lines. The walls vary in height, and their original elevation can only now be guessed at. We may add that these enclosures are so large, their arrangement so varied, and their numbers so great, that it is very difficult to give an exact description of them. A few examples will help us to do so.

The most remarkable group is probably that of Newark, in the Scioto Valley. It includes an octagon covering an area of fifty acres, a square of twenty acres, and two circles of twenty and thirty acres respectively. The walls of the larger circle still measure twelve feet high by fifty feet wide at their base; they are protected by an internal trench seven feet deep by thirty-five feet wide. According to a survey made by Colonel Whittlesey, the whole of these buildings occupy an area of twelve square miles, and the length of the line of mounds exceeds two miles. The large entrances are defended by slopes thirty-five feet high, trenches thirteen feet deep, passages forming regular labyrinths adding to the difficulties of access; mounds of strange form, one of which resembles a bird's foot, with the middle claw 155 feet long, and those on either side 110 feet long, all astonish the eye. On these abandoned ruins, forest-trees have grown to great age; others preceded them, their gigantic trunks, now in a state of decomposition, bearing witness to their existence. Man, actuated by motives unknown to us, fled

shows the source where every thing consists to the power and intelligence of the vigorous vegetation of nature is the only life which has endured.

At Chillicothe we meet with a circle more than one hundred feet in diameter and an octagon of somewhat smaller dimensions. The walls of the octagon, like those at Newark, are from ten to twelve feet high, by fifty feet thick at the base. The height of the walls of the circle, partially de-



FIG. 25.—Group at Liberty, Ohio.

stroyed, is nowhere more than four and a half to five feet. All round these enclosures great numbers of small circles, scarcely above the level of the ground, can still be made out. At Wogetown, near Chillicothe, there are a circle and a square adjoining each other; together they cover an area of exactly twenty acres.

We give a drawing of a group somewhat resembling the one we have just described, and which can be more clearly examined (fig. 25). It is situated near Liberty, Ohio, and

¹ *Fig. 25*. "Am. Monuments of the Mississippi Valley," pl. XVI.

consists of two circles and a square. The diameter of the large circle is 1,700 feet, and it covers an area of forty acres; the diameter of the little one is 500 feet; the area covered by the square, each side of which is 1,080 feet long, is twenty-seven acres. The walls are not connected with a trench, and, contrary to the custom generally followed, the earth of which they are composed is taken from trenches cut within the circle.¹

Circleville, Ohio, takes its name from structures of this kind; a square and circle touching one another. The side of the square measures 875 feet; and the diameter of the circle is 985 feet.

Eight openings, one at each angle and in the middle of each side, give access to the square mound; each of these was defended by a mound, and the circle was surrounded by a double wall. This group has already been greatly mutilated; many others have unfortunately shared its fate, and we must hasten to study these last witnesses of a by-gone condition of things, for the plow invades them every day, and no relic of this remote past can long resist the necessities of modern life.

An enclosure built of stone, near Black Run, Ross county, Ohio, merits special notice. It is of elliptical form, the large axis measuring 246 feet, and the small one 167 feet. A single opening gives access to it, and in front of this five walls stretch out in the form of a fan, but there is absolutely nothing to explain their purpose.

The number and extent of these enclosures, with the great area they cover, forbids us to look upon them as temples. We know of no worship, ancient or modern, of no rite, with which they can be connected. It is more reasonable to suppose them to have been fortified villages, according to a usage met with in various parts of the Mississippi Valley by the first explorers. According to Ferguson, the small enclosures so often joined on to the large one, was the chief's dwelling; the tents of his companions and those of

¹ Bancroft, vol. IV., p. 759; Short, p. 48.

the members of his family having been grouped about his.

Squier has given the name of temples to some truncated pyramids, the summits of which are reached by inclined planes. Some of them were doubtless so used. Occasionally these pyramids are in terraces or successive stories, but whatever their form, whether they be round, oval, polygonal, or square, they always end in a platform at the top. The



FIG. 26.—Truncated mound at Marietta (Ohio).

early explorers¹ found the houses of the chiefs in fortified villages always built on such mounds, others of which were used for religious purposes. Hence the name by which they are known. These mounds are very numerous at Chillicothe, Portsmouth, Marietta, (fig. 26), and generally throughout the whole of the State of Ohio. They are also met with in Ken-

¹ Garcilasso de la Vega reports that in Florida the chiefs used such mounds as sites for their dwellings. He mentions one no less than 1,800 feet in circumference.

tucky, Missouri, Tennessee, and the southern states. They are more rare in the North, though they occur as far as the shores of Lake Superior, which seems to have been the extreme northern limit of the mounds.

One of the most remarkable of these mounds is without doubt that of Cahokia, Illinois.¹ It rises in the centre of sixty others, of heights varying from thirty to sixty feet, and covering an area of six acres, according to Hass, but double that extent according to Putnam. The great pyramid of Cheops, we may remark by the way, covers an area of thirteen acres.

The great mound overlooks all the others, and attains, in four successive terraces, a height of ninety-one feet; its base measures 560 feet by 720; the platform covering it, 146 by 310, and it is estimated that 25,000,000 of cubic feet of earth were used in its construction.² Of course many years and thousands of workmen were needed for carrying on and completing so considerable a work.

The large mound was surmounted by a smaller one of pyramidal form, which may have been ten feet high, and was destroyed a few years ago. In demolishing it were found many human bones, bits of chert, arrow-points, fragments of coarsely made and badly burnt pottery, remains of offerings or of sacrifices. The approaches of this mound, which evidently played an important part in the history of these people, were defended by four square mounds, facing east, west, and southwest. These mounds vary in height from twenty to thirty feet, and on two of them had been erected conical pyramids, resembling pretty closely those surmounting the central mound.

The Seltzertown mound is hardly less imposing than that of Cahokia. The base is a parallelogram six hundred feet by

¹W. De Hass, *Am. Ass.*, Chicago 1867; Putnam, "Report, Peabody Museum," vol. II., p. 471. etc. Putnam gives the plan of Cahokia as it is and the restored plans. It is known under the name of Monks' Mound, because Breckenridge, who visited it in 1811, located by mistake a Trappist convent on it, which was really on a neighboring mound.

²Force, quoted above, says 20,000,000 of cubic feet only.

four hundred feet; its height is forty feet, and the platform, which is reached by a flight of steps, is no less than three acres in extent.¹ On this platform rise three conical mounds, the largest of which is also forty feet high, which gives to the structure as a whole a height of eighty feet above the ground. This mound presents this peculiarity: the whole of the northern side, that most exposed to inclemency of weather, is strengthened by a wall² two feet thick, made, as is very common amongst the Mexicans, of adobes, or mud bricks dried in the sun. Some of these bricks have retained to this day the marks of the fingers of the workmen who made them.

At New Madrid, a mound of considerable dimensions is surrounded by a trench five feet deep by ten feet wide; and the explorers of this county report having found, among the ruins bordering the rivers and streams tributary to the Missouri, a mound of the form of a parallelogram, rising above every thing near it. Professor Swallow describes one of these mounds, which he considers very ancient, as measuring nine hundred feet in circumference at its base and five hundred and seventy feet at the summit. The most interesting fact revealed by the excavation is the existence of an interior chamber, formed of poles of elm or cypress, set like the rafters in the roof of a house. The rafters were tied with reeds and covered inside and out with a plaster of marl. The outside plastering was left rough, but the inside was smoothed carefully and coated with red ochre.³ Excavations have yielded syenite disks and numerous pieces of pottery, among others a vessel moulded on a human skull, which cannot be taken out without breaking it (fig. 27). A sycamore twenty-eight feet, a nut-tree twenty-six feet, and an oak seventeen feet in circumference, overshadow one of these mounds.

¹ Squier and Davis: "Anc. Mon. of the Mississippi Valley," p. 117. Short: "The North Americans," p. 72. Foster: "Preh. Races," p. 112.

² Professor Cox has discovered near Helena (Phillips county, Arkansas) a similar wall; only the clay instead of being mixed with dry grass encloses numerous fragments of reeds.

³ "Report, Peabody Museum," 1875, p. 17.

There is no doubt that these trees are of later date than the erection of the mounds; but how much later than that erection was the seed from which these large trees were to spring flung by a chance wind upon these piles of earth?

We have spoken of the trench protecting the mound of New Madrid; in other cases the protection consists of walls of considerable height defending the approaches. At Matontiple a mound of considerable dimensions, and largely made up of baked earth, was surrounded by a circle of smaller mounds. At the junction of the Ohio and the Muskingum are to be seen two parallelograms, the walls of



FIG. 27.—Skull enclosed in an earthenware pot.

which are twenty-seven feet wide at their base. In the middle of the larger one rise four pyramids, the summit of three of which is reached by a flight of steps, whilst the fourth is inaccessible. Two embankments start from the single entrance of the enclosure, which is on the west, and run down to the river, the approaches to which they would appear to guard. On this account General Harrison has classed Matontiple among fortifications, but the absence of a ditch has led Squier to form a different opinion.

Let us now proceed with a rapid and very incomplete enumeration. One mound rises from the banks of the Etowah. It is of irregular form; it covers three acres of ground at its

base, and it is flanked by two smaller mounds, representing truncated cones with steep walls.¹ Messier Mound (Georgia) is erected on a natural eminence. The height of the artificial mound is fifty-five feet, and the platform at its summit measures one hundred and fifty-six by sixty-six feet. There is no road up to this platform, and it is difficult to climb to the top.² Messrs. Bertrand and W. Mackinley³ also speak of several conical mounds in the state of Georgia, made up of strata, one on top of the other, perhaps dating from different periods. The pyramid of Kulemokee is especially remarkable; it is no less than ninety-five feet high. We must also mention a mound twenty-three feet high, situated in the Cumberland Valley, Tennessee; excavations yielded neither bones, implements, nor pottery, but at a certain depth stones were met with arranged regularly, and which may reasonably be compared with the cromlechs of Ireland or of Wales. Recent discoveries have brought to light a large tumulus twenty-five miles from Olympia, Washington Territory; and, if the accounts of travellers can be trusted, its height is three hundred feet, far exceeding that of any other mound yet found. There is a single truncated pyramid eighty-eight feet high at Florence, Alabama, which deserves mention on account of the regularity of its construction. Each side is arranged with a precision astonishing as the work of people whom we have, till quite lately, looked upon as wrapped in barbarism.

We have followed the descriptions of American writers, who have had the advantage of writing and studying on the spot these monuments of a by-gone time. Whilst accepting their classification, however, in default of a better, we must repeat that with regard to the "temples," as well as the "sacred enclosures," there is no proof that they were used for religious rites, and it is more probable that these rites

¹ Whittlesey: "The Great Mound on Etowah River," Amer. Ass., Indianapolis, 1871. Traces of a trench are supposed to have been made out round the mound; according to Short (p. 82), its height is seventy-five feet.

² Bancroft, vol. IV., p. 267.

³ "Travels in North America," p. 223.

were solemnized on the altars of which we are about to speak.

The mounds intended as altars are some of them square, some rectangular, and others circular or elliptical. Invariably situated in an enclosure, they frequently consist of horizontal layers of gravel, earth, and sand. - Professor Andrews¹ has proved that this stratification is not, as hitherto supposed, a universal custom. These materials cover an altar always on a level with the soil, and made of flat stones, or of clay hardened in the sun or by fire. Dr. Jones mentions an adobe altar in Tennessee, on which it is easy to make out the marks of the reeds upon which it had been moulded. In exceptional cases roughly made coffins of unhewn stone are arranged round the altar. The size of these altars varies ad infinitum: some are but of a few inches square, others on the contrary are fifty feet long by fifteen feet wide. All bear traces of exposure to violent heat, and excavations seem to show that the objects offered up to the gods to whom these altars were sacred had to be purified in the flames at the time of sacrifice.

Under one of these altars have been found thousands of hyaline quartz, obsidian, and manganese arrow-points, of admirable workmanship. All were mutilated and broken by the action of the fire, and it was only after a long search that three or four were found intact. Under another mound were found more than six hundred hatchets, presenting a certain analogy with the European hatchets, of St. Acheul. These hatchets averaged seven inches long by four inches wide.² Under a third mound were exhumed two hundred calcined pipes and some copper ornaments, the latter, in many cases, covered with a thin plating of silver, all distorted by the fierceness of the heat to which they had been subjected; and lastly, under other mounds, were discovered fragments of pottery, obsidian implements, ivory and bone needles, so broken up that their original length could not be determined, and scroll

¹"The Native Americans," p. 83, note 2.

²Squier: "Anc. Mon. of the Mississippi Valley," p. 213.

work cut out of very thin plates of mica, and pierced with regular holes by which it could be suspended.

These differences between the objects dug up near the different altars are important. Some have yielded spear-heads and pipes; others, fragments of pottery and needles; others, again, only chert with no marks of human workmanship. It is probable that the offerings varied according to circumstances.

We must, however, add that lately doubts have arisen as to the purpose of these mounds. These altars on a level



FIG. 28.—Group near the Kickapoo River, Wisconsin.

with the ground, buried beneath heaps of sand or earth, appear strange, and are without precedent in the history of any known religion. The question has been asked whether they are not, after all, burial-places where cremation was the rite performed. The great number of similar objects met with seem to me to bear against this hypothesis, but this is a point which later excavations and fresh discoveries alone can determine.

Perhaps two groups recently discovered in Wisconsin¹ may be classed amongst sacrificial mounds. The first is

¹ Conant, p. 20.

situated in a low meadow near the Kickapoo River (fig. 28). The height of the central mound, which represents a radiating circle, is but three feet; its diameter is sixty feet, and is surrounded by five crescentic ridges, rising scarcely two feet above the ground, presenting a flat upper surface. Excavations show that these mounds were made up of white sand and bluish clay. They have yielded only a considerable number of plates and very thin fragments of mica. Mica seems to have been much used by the Indian tribes of the United States, who were able to obtain it. It is frequently



FIG. 29.—Group of mounds (Wisconsin).

found in graves and on the altar places, especially in the southeast, where it is particularly abundant in the mountain districts of North Carolina and Virginia.

The second group (fig. 29), situated a short distance from the first, is more complicated in its arrangement. It consists of two circles separated by a pentagon and several detached mounds. The diameter of the large circle is twelve hundred feet. In the centre rises an altar, in connection with which a romantic story about the offering up of human sacrifices has been invented, which it is unnecessary to quote.

The most numerous mounds are those which rise from

graves; at all ages and places man shows respect to the mortal remains of him who was a man like himself. Affection for parents or friends, the universal notion of a future life, vague and materialistic though it evidently was in that stage of culture, perhaps also the desire of propitiating the dead, or the fear of the vengeance of him whose corpse had been profaned; all these motives combine to produce the respect for the dead which we meet with among most barbarous as well as most civilized people.



FIG. 30.—Group of sepulchral mounds.

Sepulchral mounds (fig. 30), everywhere showing many points of resemblance, are met with throughout the United States. Frequent supplementary burials add to the originally great difficulties of studying them. At different epochs they have been used by successive tribes of Indians, and even by the whites, for the burial of their dead. It is, however, often possible to distinguish the intrusive interments, which are near the surface, whilst the bodies placed on a level with the ground certainly belonged to the race of the builders of the mounds. There are few traditions relating to these mounds among the Indians, who generally deny that they were the works of their ancestors, which often may be true, so great are the migrations and changes which

have taken place during the last few centuries. Breckenridge, however, in speaking of the excavations of the Big Mound (fig. 31), which a short time since was a prominent object within the city limits of St. Louis, says that the Indians hastened to take from it the bones of one of their chiefs.

Mounds are connected with very different rites, and among them we meet with every form of burial in use in Europe; the bodies were sometimes extended horizontally, sometimes doubled up. We noted at Sandy Woods settlement the different positions of the bodies; in Union county,



FIG. 31.—Big Mound at St. Louis (Missouri).

Kentucky, the bodies were placed one upon another without apparent method.¹ Cremation, too, was practised. In Missouri the body was sometimes covered over with a layer of clay, after which a huge funeral pile was lighted. Mention has also been made of remains found in Ohio, covered with a layer of clay made so hard by baking that it was only with the greatest trouble that it could be cut into.² Gillman tells of having found in Florida the ashes of the dead preserved with pious care in human skulls.³ In Kansas stones were heaped over the body, forming a cairn.⁴ In other places

¹ Lyon: "Smiths. Contr.," 1870.

² "Burial Mounds in Ohio," *Am. Ant.*, July, 1879.

³ Explorations in the vicinity of Aledo, Florida.

⁴ "Report, Peabody Museum," vol. II., p. 717.

skeletons have been found wrapped up in a few fragments of coarse tissue, or in bandages of bark. Squier¹ describes a sepulchre excavated under his direction in which the earth had been levelled and a layer of bark placed beneath the corpse. Round about lay some implements and a few ornaments, including two bear's teeth which were pierced; above the skeleton was a second layer of bark, carefully arranged, and, piled upon these, earth, forming a mound,

Under a mound at Chillicothe, the skeleton was discovered of a very tall woman who died young; her teeth were all intact, and at her feet lay the bones of a child. Beneath these human remains was greasy black earth, in which the microscope has revealed remains of animal matter and heaps of cinders. Further excavations brought to light a great many other bones. It is uncertain whether they were those of unfortunates offered up in sanguinary rites, or merely of those whose remains had been subjected to cremation as a mark of respect. All the bodies lay on the left side, and by each one was placed a vessel full of food, which would hardly have been provided for victims. These are very characteristic funeral rites,

Other explorers tell of vast cemeteries, or groups of mounds, which they look upon as the sepulchres of great chiefs. We shall mention the most important discoveries and endeavor to show to what different rites they bear witness.

Near New Madrid, Conant noticed that the bodies were placed horizontally, with the head turned toward the centre of the mound. Vessels were placed on the right and the left, and a third was held upon the breast by the crossed arms of the dead. Mr. H. Gillman mentions a burial mound at Fort Wayne, where the confusion in which the bones lay showed numerous secondary burials, but where inhumation had always been the mode employed. Some pottery vases give evidence of an art that had already made progress.

¹ "Ant. of the Mississippi Valley," p. 164.

The excavations at Madisonville in the valley of the Little Miami, Ohio, by Metz and Putnam, have yielded more than six hundred skeletons of every age and of both sexes. Near them were picked up numerous pots, some of them decorated with incised designs. Two were decorated with small medallions representing human heads. Other articles found were stone pipes, arrow-points, knives, hammers, polished adzes, bone implements, and shell and copper ornaments.¹

No less interesting were Farquharson's excavations near Davenport, Iowa. One of the mounds is thirty feet in diameter and five feet high. The successive layers counting from the top are: earth, one foot; stones brought from the bed of the river, one and one half feet; second layer of earth, one and one half feet; layer of shells, two inches; third layer of earth, one foot; second layer of shells, four inches. Five skeletons stretched out horizontally rested on the last layer. The objects placed with the dead consisted of a large sea-shell (*Busycon perversum*—L.); two unused copper axes covered with a woven tissue of which the remains could still be made out; an awl also of copper, a stone arrow-point, and two pipes—one representing a frog. The human bones crumbled to dust as soon as they were brought to light, so that no examination was possible. The objects picked up in the other mounds of Iowa were of a similar kind; two pipes are mentioned, one representing a pig, the other a bird, both presenting a considerable resemblance to those of Ohio. We must also mention the tooth of a gray bear, pierced with a hole by which to hang it on a cord; careful examination proved this tooth not to be a real one, but an imitation in bone. These people were therefore not wanting in powers of observation. Under a mound near Toolesborough, Iowa, was picked up a shell alleged to be native to South America,² which had been brought far away from the scenes where the mollusk had lived to which it had belonged.

¹ "Bulletin, Harvard University," June, 1881.

² *American Antiquarian*, 1879. This statement requires confirmation by an expert conchologist.

Deacon Elliot Feinck speaks of a skeleton buried head downward.¹ This would be a curious fact, but it is one of so exceptional a character in America as well as in the Old World, that one cannot help thinking the corpse was originally placed in a sitting or doubled up posture, and that the pressure of the earth or the decomposition of the body caused the head to slip between the knees. In Wisconsin the dead were wrapped in bandages of bark and seated facing the east. No weapons or ornaments were placed near them, and Dr. Lapham's numerous excavations have produced nothing but three vases of very common pottery.²

In other places, in Tennessee for instance, numerous skeletons, apparently dating from the time of the Mound Builders, have been found in caves. In one of these caves, fifteen miles from Sparta, some human remains were found enclosed in baskets made of rushes artistically plaited; nor is this an isolated instance. Heywood relates having seen on Smith's Fork, near Cairo, the skeletons of a man and of a woman laid in baskets.³ Humboldt mentions similar facts in Peru.⁴ The most curious sepulchres are, however, those in which the dead were buried between slabs of rough stone, or in sepulchral chambers, recalling the chambered barrows of England.

Since 1818, a cemetery has been found at Trenton, fifteen miles from St. Louis, where the skeletons lay in cists made of six stones, clumsily put together without cement of any kind. The largest of these cists were not more than fifty inches in length, and the bodies must have been curled up in them, or the bones placed there after decomposition of the flesh. Hence the popular belief, maintained to this day, that Missouri and Tennessee were originally inhabited by a race of pygmies.

¹ Perkins: "Ancient Burial-Ground in Swanton, Vermont," "Rep. Am. Ass.," Portland, 1875.

² "Ant. of Wisconsin," "Smiths. Contr.," vol. VII.

³ Jones: "Explorations of the Aboriginal Remains of Tennessee," "Smiths. Contr.," vol. XXII., Washington, 1876.

⁴ "Personal Travels to the Equinoctial Regions of America," vol. II., p. 6 et seq., Bolin's Edition, 1852.

Other discoveries have supplemented these. During the session of the American Association for the Advancement of Science, at Nashville, in 1877, several of the numerous mounds of Tennessee were excavated.¹ Putnam was of the opinion that they were the graves and the work of the same race as that of which he had found cemeteries in Arkansas, Missouri, and Illinois.² These mounds were situated on a farm belonging to Miss Bowling. The skulls were of similar form, the ornaments and pottery of similar manufacture. The number of the skeletons was considerable. Their figure was estimated at between six and eight hundred; one of the sepulchres alone, excavated under the personal superintendence of the learned keeper of the Peabody Museum, yielded nearly fifty. The bodies with but one exception were enclosed between slabs of unwrought stone of varying size, and these sarcophagi were arranged hap-hazard in successive layers.³ Some were empty, doubtless awaiting the body that was to occupy them. The bodies were stretched out horizontally, and near each had been placed pieces of pottery of various forms,⁴ stone and bone implements, and shell ornaments, the last souvenirs given to the dead. In Madison county, Illinois, two stone cists were found which have been described in detail by Bandelier. They form a rectangle, each side of which is made of slabs of limestone in their natural condition, showing no trace of human workmanship. The bones were so mixed together that they are supposed to have been thrown into the cist after the decomposition of the flesh. Although the antiquity of these bones seems to be great, one of the skulls

¹ "Numerous stone graves containing human remains are at the present day found along the banks of the rivers and streams in the fertile valleys, and around the cool springs which abound in the limestone region of Tennessee and Kentucky. These ancient repositories of the dead are frequently surrounded by extensive earthworks."—Dr. Jones.

² "Report, Peabody Museum," 1878, vol. II., p. 203, etc.

³ "Arch. Explorations in Tennessee," "Report, Peabody Museum," vol. II., p. 305.

⁴ In the following chapter we shall recur to the very curious pieces of pottery found in these excavations.

has been recognized by competent judges as approaching the type of the present Indian race.

More important work and more complicated arrangement are seen in the chambered mounds. We mention first one of the most remarkable tumuli, that of Grave Creek, Virginia, at the junction of that stream with the Ohio. This mound, which is of considerable size, encloses two sepulchral chambers one at about thirty feet above the other. They were built of beams, which, gradually giving way, let the stones and earth piled up on the roof fall into the vacant space and crush the skeletons which had been laid in the chambers. The upper room contained but one body, the lower two bodies—one of a man, the other of a woman. Beside them lay numerous mica ornaments, shell collars, copper bracelets, and some fragments of hewn stone. From the lower room was entered a larger one where ten skeletons were found in a squatting posture, but unfortunately so much decomposed that they could not be subjected to any scientific examination. It is supposed that they were the remains of unfortunate victims immolated in honor of the chief to whom the tomb was devoted.

At Harrisonville, Franklin county, Ohio, excavations have brought to light rough stones placed one on top of the other, without any trace of mortar; after removing the earth, roots and rubbish of all kinds covering it up, a room twelve feet square was made out, with a hearth at the end still filled with cinders and charcoal, round about which lay eight skeletons of every age from the child to the old man. In the various valleys of the same region rise similar mounds, in which have been found numerous human bones, stone implements, and fragments of pottery. In one of the skulls was stuck a spear point about six inches long which had probably inflicted the death wound. Some of the crypts had vaulted roofs¹ the better to resist the pressure of the earth above.

¹ "Recent explorations of many mounds have disclosed vaults walled and covered with stone, some of large dimensions, with contents similar to those of Utah," Conant: "Foot prints of Vanished Races," p. 75.

These sepulchral chambers are chiefly met with in the central states. Excavations in Big Mound, St. Louis, of which we have already spoken (fig. 31), and which was only destroyed in 1869, brought to light the existence of a crypt measuring thirty feet high by one hundred and fifty feet long.¹ The walls were not of stone like those just mentioned but of compact clay carefully smoothed. It is supposed that the roof had been formed of beams for supporting the weight of earth. This is a plan followed in many neighboring mounds, dating probably from the same epoch. The bodies were stretched upon the bare ground, all the heads being turned toward the east. In the black mould covering the bones, broken into fragments by the fall of earth from above, were picked up a considerable number of shells, chiefly the shells of fresh-water mussels, which are very abundant in the neighborhood, and a pretty sea-shell the *Marginella apicina* of Lamarck; also shell beads, somewhat like those found in Ohio, and cut out of the *Busycon perversum* so abundant in the Gulf of Mexico.

It is proved beyond a doubt by numerous instances that cremation was practised in certain cases by the Mound Builders, who at the same time in other cases disposed of their dead by inhumation. We have been speaking of the sepulchral chambers of the Missouri; Curtiss speaks of important groups on both sides of the river. Three of these he had excavated under his own superintendence; the crypts formed a square of eight feet with a height of four to five feet, and a passage several feet long ended in an opening facing the east. Toward the base the walls were five feet thick gradually decreasing to the top, and built of stone, without mortar or cement of any kind. One of the crypts was closed with great slabs; the others had probably been shut in with beams, long since disappeared. Each of them enclosed several skeletons,² all of which had been subjected

¹Breckenridge: "Views of Louisiana." When the excavations took place this crypt had already been disturbed, but it could still be distinguished over an area seventy-two feet in length. Conant, *l. c.*, p. 42.

²In one of the crypts Curtiss says he made out five skeletons; in an-

to fierce heat. The human bones were mixed with cinders, bits of charcoal, and animal bones, which were piled upon the ground several inches high, and amongst the remains the explorers discovered several all but unrecognizable fragments of pottery, some stone implements, and a shark's tooth. Excavations were also carried on under a large mound near by, but no traces of cremation were met with in it. The bodies were stretched horizontally on the ground, and Mr. Curtiss was able to make a valuable collection of implements, stone weapons, and carefully manufactured pieces of pottery. What were the relations between the men who buried their dead and their neighbors who burnt them? Did they belong to the same races? Did they live at the same epoch? There are no means of replying with any certainty to these questions.

Missouri is not the only region where cremation was practised. Dr. Andrews speaks of some burnt human bones found in Connett's Mound, near Dover, Athens county, Ohio, which distinctly prove that the corpse had been reduced to ashes by fire.¹ Before cremation the body seems to have been placed in a wooden coffin. The presence of remains of various matters used for food, such as those met with in the shell-heaps, points to the practice of feasting in connection with the funeral ceremonies. Dr. Larkin comes to the same conclusions after the excavation of a mound in the state of New York.² Under one of the mounds rising in the Pishtaka valley, Lapham collected some burnt clay, some stones almost converted into lime by the action of intense heat, some pieces of charcoal, and among all these a half calcined human shin-bone. Squier also mentions several instances of skeletons still showing traces of the fire which consumed the flesh.

We may also mention a mound of oval form situated in Florida. The two axes of the base measure respectively

other, thirteen. "Report, Peabody Museum," vol. II., p. 717. See also E. P. West, *Western Review*, Feb., 1879.

¹ "Report, Peabody Museum," 1877, vol. II., p. 59.

² "Report, Peabody Museum," 1880, vol. II., p. 722.

ninety-eight and eighty-eight feet. At different depths varying from one to fifteen feet numerous human bones have been picked up, bearing witness to a whole series of burials. With these bones were found several vases of remarkable execution and ornamentation, some fragments of quartz, and a stone hatchet. As the excavations proceeded, cinders, and half-consumed human bones were found; they had been collected and placed in a skull which unfortunately crumbled to dust as soon as it was brought to light. This is not a solitary instance, for we have already spoken of other cases in point. Did these skulls, the presence of which certainly proves the use of a special funeral ceremony, belong to the men whose bodies had been burned? It is difficult to say; for if on the one hand the skulls bear no mark of fire, there are on the other no remains of skulls among the human fragments collected. We must add that some of the long bones seem to have been split; if this be really the case and we attach to it its natural interpretation, cannibalism was not unknown among the Mound Builders.

We may also mention the excavations made in 1874, into the mounds on the Mississippi, opposite the town of Muscatine. They yielded human bones, and above the bones charcoal and burnt earth, a positive proof that a large fire had been lighted after burial. This was still another mode of conducting the funeral ceremony.¹

Cremation is still practised amongst some of the Indians of North America. John Leconte speaks of having witnessed scenes of this description amongst the Kokopas settled near Fort Yuma, at the junction of the Colorado and the Gila. A deep trench had been dug and wood piled up before the parents and friends brought the body. The faces of the men were painted black; the women howled and sung funeral hymns alternately. When the body was half consumed, an old man, one of the chiefs of the tribe, approached it and with a pointed stick tore out both the eyes

¹ *American Antiquarian*, 1879, 3d quarter, p. 99.

and held first one and then the other toward the sun, saying a few words which, according to the guide who accompanied Leconte, were a prayer for the deceased. When all was over and the fire put out, the assistant carefully collected the ashes and the calcined bones to give them back to the family of the departed.¹

To conclude our remarks on sepulchral mounds we must mention some facts hitherto little known, and which illustrate still better the honors rendered by the Mound Builders to their chiefs, and the pious care with which their funerals were conducted. A group of mounds (fig. 32) rises



FIG. 32.—Group of mounds at the junction of Straddle Creek and Plumb River, Illinois.

at the junction of Straddle Creek and Plumb River, Carroll county, Illinois.² The forms of these mounds vary; some are conical, others are more or less complete circles. Excavations have yielded cinders and a residuum of black mould. It is supposed that these mounds were the burial-places of men who burned their dead, that each family had its tomb, and when one of the members died his ashes were laid beside those of his people and covered with a layer of earth, and that this was continued until a cone about two feet high was formed. The circles and half circles are sup-

¹ "Cremation Amongst North American Indians."—Am. Ass., New York, 1874.

² Conant: "Footprints of Vanished Races," p. 17.

posed to indicate tombs the inmates of which were not numerous, but whose families had become extinct or dispersed, so that the graves were never filled. We give this explanation for what it is worth, only adding that similar burial-places are met with in all the districts west of the Mississippi, in the Ohio valley, Michigan, and many of the northern states.

At about two hundred and eighty yards from the group we have just noticed another has been discovered, dating apparently from the same epoch, in which the bodies were simply interred. It is alleged that tradition ascribes this change in the mode of burial to obedience to the prophets of the tribe, who were alarmed by an eclipse of the sun which occurred whilst the body of one of their chiefs was being burnt. Without attaching more importance than it deserves to this asserted tradition, we will merely add that the fact of the simultaneous practice amongst the same people of two funeral rites so different as cremation and interment would surprise us more, if we did not know of many analogous examples among the various races of Europe.

The second group (fig. 33) discovered in Minnesota, on the northern bank of the St. Peter's River, about sixty miles from its junction with the Mississippi, is of more complicated appearance. It includes twenty-six mounds placed at regular distances from each other, and forming together a large rectangle.¹ The central mound (*a*) represents a turtle forty feet long by twenty-seven feet wide and twelve feet high. It is almost entirely formed of yellow clay, foreign to the locality, and doubtless brought from a distance. On the north and south rise two mounds (*d*) of triangular form, composed of red earth, covered with a thin layer of soil. Each of these mounds is twenty-seven feet long by about six feet wide at the wider end, gradually decreasing toward the opposite end, which scarcely rises above the level of the soil. At each corner rises a circular mound (*f*) twelve feet high by twenty-five feet in diameter. On the east and west are two

¹ Conant: "Footprints of Vanished Races," p. 18.

elongated mounds (*c*) sixty feet long with a diameter of twelve feet. Two smaller mounds (*e*) on the right and left of the turtle are each twelve feet long by four feet high. They consist of white sand mixed with numerous fragments of mica and covered with a layer of clay and a second one of vegetable mould. The two mounds (*b*) differ in height; that on the south being twelve feet high by twenty-seven feet in diameter, whilst that on the north is only four feet high, with a diameter of twenty-two feet. Lastly thirteen little mounds, the dimensions of which are not given, complete this remarkable group, which must have cost the builders all the more work because part of the



FIG. 33.—The burial-place of the Black Tortoise.

materials can only have been obtained from a considerable distance.

Here is the explanation given by Conant, of the whole group. The principal tomb (*a*) would be the last home of a great chief, the *Black Tortoise*; the four mounds (*f*) which form the corners of the quadrangle were also erected as a sign of the mourning of the tribe; the secondary mounds would be the tombs of other chiefs, and the little mounds erected in the north and south correspond with the number of bodies which had been deposited in them. The two pointed mounds (*d*) indicate that the *Black Tortoise* was the last of his race, and the two large mounds the

importance of that race and the dignity that had belonged to it. Lastly, the two mounds (*e*) on the right and left of the royal tomb mark the burial-places of the prophets or soothsayers, who even to our own day play a great part among the Indian tribes. The fragments of mica found in their tombs would indicate their rank. It may be said that in the absence of any accurate information whatever, as to the origin and use of these mounds, the preceding hypothesis is not more unfounded than many others which might be invented.

Of all the mounds erected on American soil, the most curious are without doubt those representing animals, first noticed and described by Mr. W. Pidgeon in 1853. They are met with in Iowa, Ohio, Illinois, Missouri, Indiana, and generally speaking in all the states of the far west; but the chief centre of these singular erections seems to have been Wisconsin, where they are very numerous. Some archæologists think that the animal mounds may perhaps have been intended to represent the *totem* or distinctive symbol of a clan. This symbol is often an animal, such as the eagle, wolf, bear, turtle, or fox, but, if the observations made may be relied on, they are as often representations of objects not totemic as otherwise. They represent men with the trunk, head, arms, and legs, still recognizable; mammals sixty-five yards long; birds¹ with outspread wings measuring more than thirty-two yards from tip to tip; reptiles, turtles, and "lizards" of colossal dimensions; and, lastly, Pidgeon mentions having seen in Minnesota a huge spider, whose body and legs covered an acre of ground.

These mounds of diverse form are grouped without apparent order,—now by the side of pyramids or truncated cones, now in the midst of circles or rectangles connected with the structures we are about to describe. At Pewaukee, Wisconsin, seven turtles, two "lizards," and four mounds of

¹ Mounds of the form of birds have recently been discovered in Putnam county, Georgia. This is an interesting fact, for hitherto such mounds had only been found in the northern and western states.—"Bird-shaped mounds in Putnam county, Georgia," *Anthr. Inst. of Great Britain and Ireland*, 1879.

elliptical form can be made out together. One of the turtles, the largest yet discovered, measures no less than four hundred and fifty feet. A little farther off, in Dane Co., we meet with a group of quadrupeds,—buffaloes according to some authorities, pumas according to others. Their length varies from eighty-two to one hundred and fourteen feet. In other places an observer of lively imagination can make out elks, bears, wolves, panthers, eagles, wild geese, herons, even frogs. What is more certain than their form, however, is, that in the vast western plains these ridges can easily be seen from a distance, though their height seldom exceeds two yards, and



FIG. 34.—Mound supposed to represent a man.

often amounts only to a few inches. We may as well add that nothing has been found in the numerous excavations made into mounds of this description, and that some archæologists are bold enough to doubt the very existence as artificial structures of many of those which have been described. However, from among the most celebrated mounds of this sort we select a human figure (fig. 34), in which the design may be admitted. It is stated that a more or less ancient tradition alleges that this mound was erected in honor of a chief killed in battle. The little mound placed

between the legs was sacred to the memory of his son, killed fighting by the side of his father. We may also refer to the "alligator," of Granville, Ohio, (fig. 35); the length of the



FIG. 35.—Curved section of the mountain, and plan of the so-called alligator mound.



FIG. 36.—Mound supposed to represent a mastodon.

body is two hundred and five feet, that of each foot is twenty feet; it is evidently not an alligator, for the aborigines were too good observers to give an alligator a round

head. It might have been intended for an otter, or the great salamander (*menopoma*), if really designed for an animal at all. Another has been claimed as a mastodon (fig. 36), and is situated a short distance from the junction of the Wisconsin and the Mississippi rivers. It is considered to be a surprising likeness by archæologists who are not zoölogists.

Other enthusiastic investigators have discovered in Wisconsin a monkey 160 feet long. Its alleged tail forms a semi-circle, which, uncurled, would measure no less than 320 feet.¹ In one of those in Wisconsin a bird is represented just about to take flight, and under one of its wings is a little elliptical mound.



Lapham thinks he makes out a complete allegory in this: The bird is taking to the land of spirits the soul of him to whom the mound is sacred, and this soul is represented by the little mound under the wing of the bird.²

We must not omit the great snake set upon a hill overlooking Brush Creek, Adams county, Ohio. His coils are about 700 feet long, and he appears to be swallowing an egg, which he holds in his mouth and which is represented by a mound, the large axis of which measures 160 feet. Probably we have an allegory here also. The serpent plays an important part in the mythology of the American aborigines. We find it represented on their pottery. Out of eighteen Busyon shells, now in the Peabody Museum, which had served as ornaments to these unknown people, thirteen are engraved with the figure of a serpent. The National Museum at Washington possesses a pipe representing a human figure with a serpent coiled round the neck; and that of Mexico, a vase remarkable for the elegance of its shape, the handle of which is formed by a serpent. (fig. 37).

¹ Foster, "Prehistoric Races," p. 101.

² Ant. of Wisconsin, pl. XLVI., fig. 4.

We have other yet more curious instances. In several places, though we cannot interpret its meaning, we meet with the representation of a serpent swallowing the head of a turtle. The Dominican monks of Mexico have preserved and set up over their entrance gate an antique bas-relief representing a serpent crushing a human victim in his coils. At Chichen Itza colossal serpents are carved on the walls of the palace. Near Jalapa, in the province of Vera Cruz, a serpent fifteen feet long is distinguishable sculptured on a rock,¹ and similar serpents are found in the bas-reliefs of the temple of Huitzilopochtli, which dates from the time of the Aztecs, as well as on the walls of the buildings of Cuzco, witnessing to Peruvian splendor.

The very name of some races recalls the worship of the serpent. The Nahuas, who share with the Mayas the honor of having enjoyed the highest known civilization of ancient America, are often called the *Culhuas*, or the men of the race of the serpent; among the Mayas the empire of Xibalba was known under the name of the Dominion of the *Chanes*, or serpents. May we not trace to this origin the veneration in which certain Indian tribes of New Mexico still hold the rattlesnake? They keep it in certain caves of their mountains, the entrances to which they hide with jealous care, and it is said they go to worship it in secret.²

On the northern banks of the Wisconsin rises a strange group (fig. 38), which is a true puzzle to explorers.³ It includes one figure 180 feet long, placed horizontally, and another 160 feet long, arranged perpendicularly with regard to the former. The latter abuts upon a ridge eighty feet long by six feet high and twenty-seven feet in diameter. On the same line are a series of mounds of conical shape and graduated size, the largest representing the same diameter as that of the above-mentioned ridge. The first figure has been re-

¹ Rivero, "Hist. de Jalapa, Mexico," vol. I., p. 7.

² Bandelier: "Ruins of the Pueblo of Pecos."

³ Conant: "Footprints of Vanished Races," p. 32, etc.

garded as an elk, the second as human. The horns of the elk are of unequal size, and at its feet is one of the triangular mounds which have been supposed to typify the extinction of a race. This group is explained as intended to commemorate the alliance of two tribes, of which the elk and the buffalo were the *totem* or the symbols. These once powerful tribes, exhausted by long and bloody struggles, united for the common defence, and their alliance is indicated by the touching of the man's hand and the elk's foot. The two mounds on the right and the left are regarded as altars, on which sacrifices were offered to commemorate the union of the two tribes. A layer of burnt earth, cinders, and



FIG. 38.—The so-called "man and the elk" mounds in Wisconsin.

charcoal, fourteen inches thick, seems to justify this supposition. An old tree has pushed its roots beneath the mounds; and its 424 concentric rings of growth form the only guide we have as to the age of this interesting group. Why one tribe was represented by its symbol and the other not, is not explained by the above hypothesis.

Several mounds show a variety worthy of remark. Some animals of dimensions pretty nearly resembling those of which we have just spoken, are represented, not by ridges but by ditches. We mention this fact, while we fully recognize that in such a matter imagination is offered unlimited scope.

In other places representations of inanimate objects are

of, such as a cross on the shores of Lake Michigan,¹ Greek cross in Ohio about twenty-nine yards long, a large hollow in the centre about six yards deep. We may also mention a cross in the valley formed by the Scioto River. The arms of this cross appear to be equal, and the plow has already commenced its work of destruction and it is impossible to determine the length. A mound on the banks of the Scioto² represents a boat fifty yards long by about thirty yards wide, and a little off the explorer makes out some groups which he calls, according to the fancy of the moment, clubs or We are not disposed to attach importance to resemblances probably quite accidental.

Though incredulous as to certain interpretations which would have accepted, it is difficult to repress surprise in contemplating the admittedly genuine works accomplished by these vanished people with only the help of tools, baskets, and persistent manual labor. In fact they had at most some copper implements. Iron and bronze appear to have been practically unknown to them, and in no part of a vast territory they occupied have excavations revealed the existence or the use of any metal but copper, with its associated silver, gold and a few fragments of meteoric iron. But our astonishment is redoubled when we find these men digging canals to establish water communication, a striking proof of a numerous population, a decided advance on the nomadic state, though, as evinced by numerous Asiatic peoples, not necessarily an indication of a high degree of culture. Lately traces of such have been made out in Missouri. Dr. G. Swallow, Geologist of Missouri, calls the attention of archaeologists to them, and describes one fifty feet wide by twelve feet deep. There are others in different places. All are of Asiatic design, and, according to that gentleman, they

¹Am. Mus. Nat. Hist.: "Ant. of Wisconsin," pp. 20 and 39, pl. XXXI., figs. 2 and 3.
²Le Hass: "Arch. of the Mississippi Valley," Rep. Am. Assoc., 1868.

are executed with intelligent reference to the difficulties of the ground. Earthquakes have in many places destroyed the traces of these canals—the progress of civilization is perpetually levelling their embankments—but the works can still be made out, and on a line seventy miles long a series of canals can be recognized connecting the Mississippi with Big Lake, Cushion and Collins lakes.¹ These people may have navigated the canals in boats, which we can confidently assert they knew how to hollow out, with the aid of fire, from the trunks of trees.² Similar processes were employed in Europe in the early days of navigation. Recent discoveries have suggested the existence of pile-dwellings rising from the Great Lakes of the north.³ All over the earth similar wants have led to similar efforts of intelligence and similar products of industry. This is a fact of very great importance.

In closing this chapter, what, it may be asked, are we to believe was the character of the race to which for the purpose of clearness we have for the time being applied the term, "Mound Builders"? The answer must be, they were no more nor less than the immediate predecessors in blood and culture of the Indians described by De Soto's chronicler and other early explorers, the Indians who inhabited the region of the mounds at the time of their discovery by civilized men. As, in the far north, the Aleuts up to the time of their discovery were, by the testimony of the shell-heaps, as well as their language, the direct successors of the early Eskimo,⁴—so in the fertile basin of the Mississippi, the Indians were the builders or the successors of the builders of the singular and varied structures just described. It is true that a very different opinion has been widely entertained, chiefly by those who were not aware of the historical

¹ Letter from M. Carlton, quoted by Conant: "Footprints of Vanished Races," p. 78.

² Schoolcraft: "Archives of Aboriginal Knowledge," vol. I., p. 76.

³ *Am. Antiquarian*, Jan., 1881, p. 141.

⁴ "See Contributions to North American Ethnology," vol. I., 1877. Article 2. "On Succession in the Shell-heaps of the Aleutian Islands."

evidence. Even Mr. Squier who, in his famous work on the ancient monuments of the Mississippi valley, makes no distinction in these remains, but speaks of the Mound Builders as an extinct race and contrasts their progress in the arts with the supposed low condition of the modern Indians, in a subsequent publication felt compelled to modify his views and distinguish between the earthworks of western New York, which he admits to be of purely Indian origin, and those found in southern Ohio.¹ Further researches have shown that no line can be drawn between the two; the differences are merely of degree. For the most part the objects found in them, from the rude knife to the carved and polished "gorget," might have been taken from the inmost recesses of a mound or picked up on the surface among the débris of a recent Indian village, and the most experienced archæologist could not decide which was their origin. Lucien Carr² has recently reviewed the whole subject in a manner which cannot but carry conviction to the impartial archæologist, but the conclusions he arrives at have the weight of other and, as all will admit, most distinguished authority.³

¹ "Smithsonian Contr. to Knowledge," ii., p. 83, 1851.

² "Mounds of the Mississippi Valley," "Memoirs of the Kentucky Geological Survey," vol. II., 1883.

³ The earthworks "differ less in kind than in degree from other remains respecting which history has not been entirely silent."—HAVEN. "There is nothing indeed in the magnitude and structure of our western mounds which a semi-hunter and semi-agricultural population, like that which may be ascribed to the ancestors or Indian predecessors of the existing race, could not have executed."—SCHOOLCRAFT. "All these earthworks—and I am inclined to assert the same of the whole of those in the Atlantic States and the majority in the Mississippi Valley—were the production, not of some mythical tribe of high civilization in remote antiquity, but of the identical nations found by the whites residing in these regions."—BRINTON. "No doubt that they were erected by the forefathers of the present Indians."—Gen. LEWIS CASS. "Nothing in them which may not have been performed by a savage people."—GALLATIN. "The old idea that the mound builders were peoples distinct from and other than the Indians of the fifteenth and sixteenth centuries and their progenitors, appears unfounded in fact, and fanciful."—C. C. JONES. "Mound builders were tribes of American Indians of the same race with the tribes now living."—Judge M. F. FORCE. "The progress of discovery seems constantly to diminish the distinction between the ancient and modern races; and it may

It is not asserted that the mounds were built by any particular tribe, or at any particular period, nor that each and every tribe of the Mississippi valley erected such structures, nor that there were not differences of culture and proficiency in the arts between different tribes of mound builders as between the modern Indian tribes now known.

All that can be claimed is that there is nothing in the mounds beyond the power of such people as inhabited the region when discovered; that those people are known to have constructed many of the mounds now or recently existing, and that there is no evidence that any other or different people had any hand in the construction of those mounds in regard to which direct historical evidence is wanting.

"Summing up the results that have been attained, it may be safely said that, so far from there being any *a priori* reason why the red Indians could not have erected these works, the evidence shows conclusively that in New York and the Gulf States they did build mounds and embankments that are essentially of the same character as those found in Ohio."

"In view of these results, and of the additional fact that these same Indians are the only people, except the whites, who, so far as we know, have ever held the region over which these works are scattered, it is believed that we are fully justified in claiming that the mounds and inclosures of Ohio, like those in New York and the Gulf States, were the work of the red Indians of historic times, or of their immediate ancestors. To deny this conclusion, and to accept its alternative, ascribing these remains to a mythical people of a different civilization, is to reject a simple and satisfactory explanation of a fact in favor of one that is far-fetched and incomplete, and this is neither science nor logic."—(Carr, *l. c.*, p. 107.)

not be very wide of the truth to assert that they were the same people."—LAPHAM. See CARR, *l. c.*, p. 4, note.

CHAPTER IV.

POTTERY, WEAPONS, AND ORNAMENTS OF THE MOUND BUILDERS.

THE humblest forms of ceramic art were among the first inventions of the human race. Dishes of some sort are indispensable for holding the food of man, and no matter how remote the age to which we look back, we find them among the relics telling of his presence. They were used in religious ceremonies; they played a part in funereal honors in countries differing greatly from each other, and in accordance with a sacred rite they were placed beside the dead. A potter's college was founded at Rome by Numa; a family of potters, workmen of the king, is mentioned in the genealogy of the tribe of Judah, and the author of Ecclesiastes speaks of them seated near the wheel that they turn with their feet. Agathocles, King of Sicily, according to Diodorus Siculus, gave to his friends vases of precious metals, telling them that they were copied from earthenware models fashioned by himself when he was a potter; and every one has heard of the curious pottery discovered at Troy by Dr. Schliemann. The most beautiful belonged to the town of Dardanus, of which it is related that it was destroyed by his grandson Hercules.¹ All these sorts of pottery, however, show an already considerable advance in ceramic art, and we are doubtless far from any knowledge of the very first essays of this description; they would be too coarsely executed and too badly baked to have been preserved to our day. In the earliest days of his existence, man must have observed the adhesiveness and plasticity of the damp clay lying at his feet.² Chance perhaps in the first instance may have led

¹ "Iliad," Book V., verse 642.

² "Clay is a material so generally diffused, and its plastic nature so easily dis-

him to knead it; a ball, the plaything of the moment, flung hastily away, may have been hardened by the powerful rays of the sun. The impressions made upon it resembled those in the rock, where the same man went to draw the water he needed. Facts such as these could not have escaped his observation, and appealed to the love of imitation innate in human nature. Fire was found to dry his rude pots quicker than the sun, and man learned to turn it to account. The cooking of his food was one of man's first advances, and was once considered as the primary distinction between him and an animal; observation supplemented by reflection must have led him to encase in earth the food or the calabashes he submitted to the heat of his fire. Goguet relates that in 1503 Captain Gonneville visited some Indians who had amongst them wooden dishes, which they covered with a thick coating of clay before putting them near the fire.¹ Cook mentions² dishes seen at Unalashka "made of a flat stone with sides of clay not unlike a standing pye." In other places pots have been met with which appear to have been hardened by putting red-hot coals in the interior.³

The natives of Murray Island cook their food in a hole dug in the earth, which they are careful to line with well kneaded clay before lighting the fire. The Indians of the Gulf of Florida moulded their pottery on gourds, and to support the large pots until baked they covered them with baskets made of rushes, creepers, or even of netting, the marks of which on the baked clay can still be made out.⁴ Some must have been moulded on or in coarse tissues, or wooden moulds, which were destroyed in the baking, though indelible

covered, that the art of working it does not exceed the intelligence of the rudest savage." Birch: "Ancient Pottery," Introduction, p. 1.

¹ "Mémoire touchant l'établissement d'une mission chrétienne dans le troisième monde, autrement appelé la Terre Australe," Paris, 1663, published by the Abbé Paulmier de Gonneville, one of the descendants of the captain.

² "Voyage to the Pacific Ocean," 1784, vol. II., p. 511.

³ One of these can be seen in the Peabody Museum. It is marked No. 7,750 in the catalogue.

⁴ Rau: "Indian Pottery," Smiths. Contr., 1866. Tylor: "Early History of Mankind," p. 73.

traces of them exist to this day. Many methods may have been employed in the fabrication of the first pottery; probably all were tried and led to or perfected this useful discovery.

As already stated, fragments of pottery have been found in America in the caves which were the first dwelling-places of man, under the shell-heaps which bear witness to his long sojourn; but it is chiefly in the mounds, and above all in the sepulchral mounds, that the most important specimens have been found.

Funeral vases date from the most remote antiquity. The belief in immortality, with which human nature is so deeply imbued, is vividly revealed. Man, however savage, however degraded we may suppose him to be, looks confidently beyond this life, which for him passes so rapidly away. He does not admit that he is to disappear for ever, like the grass he treads beneath his feet, or the animals subject to his needs or his pleasures. His imagination doubtless does not soar beyond the enjoyments of a purely material existence, free from work and anxiety; but he endeavors to assure to those he has loved here that existence in the unknown world to which death has taken them. Hence the numerous and varied objects found in tombs, secret tokens left by men of every age and every clime.

It is in the valleys of the Missouri and its tributaries that we meet with the pieces of pottery most interesting alike in their form and ornamentation.¹ The country had been inhabited by men owning towns, a government, a religious system, and artistic tastes—tribes more advanced in culture than many of their relatives the Indians with whom the French, the first explorers of the Mississippi and the Missouri, had later to contend. St. Louis, one of the towns founded by the French, is sometimes called Mound City, on account of the number of mounds surrounding it, and which long remained unnoticed by the rough laborers who were

¹ E. Evers: "Ancient Pottery of Missouri," Saint Louis Academy of Sciences, 1880. Conant: "Footprints of Vanished Races," Saint Louis, 1879.

the first colonists of the country. Judging from the objects they contain, these mounds are less ancient than those of Ohio or of Wisconsin. The fragments of pottery found in them are innumerable. One mound is mentioned in which more than a thousand specimens have been collected.¹ The burial-places excavated at Sandy Woods have yielded nearly as many.² Some suppose the numerous fragments found in some parts of Michigan to point to the existence of actual manufactories.³ The collections of the St. Louis Academy contain four thousand carefully selected specimens, and doubtless a very much greater number must have been destroyed and scattered before their importance was suspected. In the state of Vermont, for instance, only six pieces are mentioned as intact amongst all those discovered.⁴ These fragments, which have defied the wear and tear of centuries, are the imperishable witnesses of men, the very memory of whom has been completely lost to those who succeeded them.

The pottery manufactured in America was evidently very superior to that produced in Europe during the same period of development.⁵ It is also probable that many of the numerous fragments of which we were unable to fix the date belong to very remote epochs. They are rarely associated with metal objects, and the only weapons of the Mound Builders were hatchets, knives, or arrows of stone,

¹ This number need not surprise us. Who does not know the hill at Rome formed entirely of fragments of the pottery of the ancient Romans, and, to quote but one other example, at Arles fragments have been found in sufficient quantities for the embankments of the railway crossing the northern part of the Camargue to be exclusively formed of them, for a distance of about one and a quarter miles.

² W. P. Potter: "Arch. Remains in S. E. Missouri," Saint Louis Acad. of Sciences, 1880.

³ Gillman: "Report, Peabody Museum," vol. I.

⁴ G. H. Perkins: "General Remarks upon the Arch. of Vermont," Proc. Am. Assoc. for the Advancement of Science, St. Louis, 1878.

⁵ Among none of the Western nations of Europe, not even among the Swiss Lake Dwellers, whose civilization was in some respects far advanced, do we know of these little figures representing either men or animals.

which resemble alike in form and workmanship those of Europe, dating from the period to which archæologists have given the name of the Stone age.

The pottery of the Mound Builders was manufactured of a clay of a fairly dark gray color, sometimes verging on blue; to give this clay more consistency the potter mixed it in Mississippi with sand and fragments of shells, in Vermont with bits of quartz, mica, or feldspar, and in other places with little nodules of carbonate of lime.¹ The thickest and clumsiest of the pieces were the only ones in which this precaution was not taken. On the other hand the finer pieces of pottery were mixed with gypsum, by which means lighter shades of color were obtained. When sufficiently kneaded and shaped to the form required, the workman smoothed the surface with his hand and dried the vase, probably first in the sun and later in a fierce fire, which was a very imperfect mode of baking. In their remarkable work on the mounds of the Mississippi valley, Squier and Davis assert the existence of real ovens,² intended for baking pottery. Other explorers speak of similar ovens near Cedar City, which rises from the ruins of an old Aztec town.³ Nothing however, proves them to be of very remote antiquity, and it is probable that their construction indicates a progress that time alone could have brought about. Neither is it impossible that the ancient Americans employed a process till quite recently in use amongst the Indians of California, who placed the pieces of pottery to be baked in large holes dug in the earth, and heated by means of fires made of blazing chips of wood.⁴ Other methods too may have been adopted; but with regard to them as with those just mentioned nothing positive can be asserted.

¹ W. de Hass: "Arch. of the Mississippi Valley," Proc. Am. Assoc., Chicago, 1868.

² "An. Mon. of the Mississippi Valley." Bancroft says: "Pottery kilns were found in the South; but that they were the work of the Mound Builders has not been satisfactorily proven."—"The Native Races," Vol. IV., p. 780.

³ Remy and Brenchley: "A Journey to Great Salt Lake City." London, 1861.

⁴ Schumacher: "Report, Peabody Museum," 1879, vol. II., p. 521, et seq.

as well as in South America. Considering, however, the finish and symmetry of certain specimens which have come down to us, it is difficult to believe that the workmen had no mechanical process by means of which to ensure uniformity of pressure. Such was the opinion of eminent archæologists, after an attentive examination of several pieces of pottery found in excavations made near New Madrid.¹ Unfortu-



FIG. 39.—Bottle of baked clay found in a mound in Missouri.

nately these specimens fell to pieces as soon as they were exposed to the air, so that further examination is impossible, and the problem remains unsolved.

The great varieties of form assumed by American pottery resemble strangely these of the Old World, alike of pre-historic² and of modern times.³ Everywhere, we repeat, the same

¹ Conant : "Footprints of Vanished Races."

² The pieces of pottery found under the mounds may be compared especially with those from the covered way of West Kennet, Wiltshire, England.

³ In March, 1882, a Japanese book containing a description of the shell mounds of Omori, Japan, was presented to the Anthropological Society. Numerous fragments of pottery were found at Omori, and their resemblance to those of the American mounds was very striking.

needs have led man to make the same efforts of intelligence and to produce the same creations of industry. Some of these vases are painted, the colors chiefly employed being black and very dark gray. Red, yellow, white, and brown vases are, however, met with; these colors, being generally added after baking, have little stability, and in spite of every precaution they scale off or are rubbed out very rapidly. Sometimes the ornaments stand out in different colors, always shaded with great taste, as proved by numerous ex-



FIG. 40.—Jar found in a Ohio mound.

amples which might be given.¹ One little vase about eight inches high is decorated with black and red lines on the neck and red and white on the body. Another has six concentric circles of red and white alternately, and in the centre of each circle a St. Andrew's cross in white. One bottle has rays of equal size in brown, white, and bright red (fig. 39). A vase from Ohio merits representation (fig. 40), on account

¹ Those who are especially interested in this question may consult a recent work, Dr. Ed. Evers' "Contributions to the Archaeology of Missouri," part I., Pottery. Salem, Massachusetts, 1880. We have borrowed largely from it.

of its complicated ornamentation, in which some think they can make out a bird's head. It is the same with a vase found in Arkansas and decorated with finely executed representations of bones of the dead (fig. 41).¹ Some pieces of pottery recently found and deposited in the St. Louis museum are said to recall, in the figures with which they are decorated, Egyptian or Etruscan art. These figures have not yet been published, so that we must content ourselves with mention-



FIG. 41.—Vases from the tumuli of Arkansas.

ing the fact, reserving our opinion until further information is obtained. In the course of this work we shall have occasion to refer to other no less curious and important resemblances.

We do not know what was the substance employed in coloring pottery, but some red ochre has been found in a

¹ We reproduce this curious vase, but we believe it to date from a less ancient period. The same style of decoration is, however, met with amongst the aborigines of America, and Bancroft speaks of a stone seen at Nohpat, Yucatan, on which are engraved representations of human skulls and cross-bones.

vase, which may have been used for this purpose. Some of the colors seem to have been fixed by means of a varnish, of which traces are supposed to have been found.¹ This process was certainly known to the Mexicans and the Peruvians, but it was more rarely employed by the Mound Builders. We are ignorant as to what this glaze was made of. One thing only is certain, that the metallic varnish used in modern potteries, and that of more complicated composition employed for porcelain, were introduced by the Spaniards, and no discovery thus far made in America permits us to attribute a knowledge of it to the ancient inhabitants. Some Americans mention an earthenware vase covered with



FIG. 42.—Vase found under a sepulchral mound in Missouri.

a siliceous varnish, found in a mound of Florida; but the circumstances of the discovery leave no doubt as to the mound having been disturbed. In Europe enamelled ceramic work was known in the most remote antiquity, and in Egypt we find vases, statuettes, and amulets of glazed porcelain dating from the earliest dynasties.

The ornamentation of these vases, generally very simple, usually consists of several rows of dots, such as can be seen

¹ Bancroft (vol. IV., p. 714) says: "To this day some of it retains a very perfect glaze." Gaspar Castaño de Sosa ("Mém. del Descubrimiento, del Reino de Leon," 1590) speaking of the pottery of the pueblos of New Mexico, says: "Tienen mucha loza de los colorados y pintadas y negras, platos, caxetes saleros, almoficos, xicaras, muy galanas alguna de la loza esta vidriada."

on the earliest pottery of Europe, and executed, as those were, either with the potter's nail, with the end of a pointed instrument, a bit of wood or a shell, which give a distinct mark without a jagged edge. In other examples we have more complicated combinations, lines, circles, ellipses, crescents, wolf's teeth, zig-zags tastily arranged, so as to obtain the happiest effects (fig. 42). Sometimes on the neck or body of the vase was the figure of a rope or a creeper. Gillman mentions several pieces of pottery decorated in this manner, notably those found at Fort Wayne.¹ Some vases have



FIG. 43.—Vase found in the excavations in Missouri, with ornaments in relief painted in red of various shades.

denticulated or fringed edges; in others the ornaments are in relief (fig. 43). These reliefs were obtained either by moulding the clay itself or by the application of moulds before baking. Numbers of these vases had handles, and these handles often represented birds, mammals, such as the wolf, the fox, and further south the llama, and even human figures. It would take a long time to describe all the varieties; as it

¹ "Proc. Am. Assoc.," Buffalo, 1876. This mode of ornamentation was frequently employed in Maine, Massachusetts, Missouri, Illinois, Ohio, Tennessee and Florida. "Report, Peabody Museum," 1872.

is evident that the potters were always at work, striving to satisfy their artistic tastes. They appear, however, to have been held in small esteem in Central America, if we are to accept the words of the Popol Vuh¹: "You will no longer be fit for any thing but to make earthenware things, such as pie-dishes or saucepans, or to cultivate maize; and the beasts that live in the shrubbery will be your only portion."

Any description of this pottery is difficult, if not impossible. It is as if one attempted to describe all the things now to be found in the shop of a famous dealer in crockery. We



FIG. 44.—Bottle or vase, with a neck of remarkable delicacy; New Madrid, Missouri; 8½ inches high.

will endeavor to class the vases found under the mounds, according to the shape of the specimens and the purpose for

¹ The Popol Vuh, the name of which may be translated "Collection of Leaves," is written in the Qquiché language, and was discovered in the second half of the 16th century, by a Dominican monk in a village of Guatemala. It contains several details strangely resembling those of Genesis, and some have seen in them an adaptation, by a pious fraud, of Indian mythologies to the dogmas of Christianity. Such was not the opinion of Brother Ximenes, who was the first to reproduce the Popol Vuh, and did not hesitate to call it the work of the Devil. It was republished at Vienna in 1857 by Dr. C. Scherzer, and in 1861 the Abbé Brasseur de Bourbourg, who characterized it as a sacred book, issued it again. The original text is not extant; it was evidently written or corrected after the Spanish conquest, for one of the Indian chiefs is mentioned by his Spanish name. In spite, therefore, of M. Brasseur de Bourbourg's opinion, we can place but a very limited reliance on this book.

which they seem to have been intended; we shall then have certain data to go upon.

Perhaps more vases with necks have been found than any other kind. They were probably used to hold liquids; most of them are black and carefully moulded; they recall the vases known to travellers as "monkeys," still used by the Spaniards and the inhabitants of South America, to keep their drinking-water cool (figs. 39, 44, and 46). The porosity of the clay leads to evaporation, hence rapid cooling. Some



FIG. 45.—Vase found in a child's grave in Tennessee.

vessels have a swelling at the base; others are ovoid and are pierced with lateral holes through which were passed cords to hang the vases up by. We give a representation of a vase with three feet (fig. 45), discovered beneath a mound in Tennessee which had served as the grave of a child. It is black and was merely baked in the sun; the feet are hollow and connected with the body of the vase.¹ Others

¹ Putnam: "Report, Peabody Museum," 1878, vol. II. Dr. Habel ("Smith.

have been found provided with a stopper, also of earthenware; one of them still contained the traces of a red liquid that could not be analyzed." The ornamentation



FIG. 46.—Vase with spiral grooving in the Museum of the Academy of Sciences, St. Louis.



FIG. 47.—Vase found in a grave in Missouri.

Cont.," vol. XXII.), speaks of similar vases near San Salvador, and in Nicaragua. The feet enclose little clay balls. Bancroft (vol. IV., p. 19), also mentions some found under the huacas of Chiriqui.

ent: "Footprints of Vanished Races."

ly varied and resembles that we have before described. The St. Louis museum possesses amongst other specimens a specimen (fig. 46), in which we notice a series of swellings and depressions, forming a regular spiral. Although the form is graceful the vases used for cooking purposes are noticeable for the coarseness of their execution and ornamentation (figs. 42, 47, 48, and 49). They generally have a large



Fig. 48.—Vase with handles from a sepulchral mound in Tennessee.



Fig. 49.—Vessel with four handles, six inches high by about eight in diameter.

They are sometimes provided with a cover to hasten boiling. They all have one or more handles, by means of which they are more easily moved. One is mentioned with a long handle like those of our saucepans (fig. 50); others have the rim pinched out so as to form a spout (fig. 51). Several of these vessels bear marks of long usage, and retain traces of the fire on which they had been placed.

In excavations we also often meet with pieces of black earthenware, the body of which is elliptical, of careful execution, and having a handle on one side often representing a bird, and on the other a brim or knob by which they can the more



Fig. 50.—Black cooking pot of coarse execution, found beneath a mound in Missouri.



Fig. 51.—Vessel with a spout. Missouri.

easily be held (fig. 52). Some are almost completely closed, and have but one orifice, large or small; others contain some little pellets of clay, intended to make a rattling noise.

se vessels do not appear ever to have been subjected to heat of an oven; hence the hypothesis that they may have been used as lamps, and their comparison with Etruscan and Roman lamps. This would certainly be an interesting one, but it appears to us most improbable; for the vases of this kind found as yet show no traces either of oil or of any matter used for lighting purposes.



Fig. 52.—Vessel found in Missouri. (Half natural size.)



Fig. 53.—Basin, with a rough attempt at ornamentation. (Diameter, nine inches; height, eight.)

Basins, generally pretty rare, are the coarsest in execution of the pottery preserved in the St. Louis museum; from which, without any good foundation, it has been decided that they are of the greatest antiquity. We give illustrations of two of these basins (figs. 53 and 54), of different

forms, from which it is easy to judge of their use and the mode of their construction. They are of black earthenware, and one of them shows a rough attempt at ornamentation.¹

Cups, which doubtless served as drinking-vessels, are small, round or oval, and always provided with a handle, often representing the head of a man or of an animal. We



Fig. 54.—Basin found in Missouri (one third natural size), in black sun-dried earthenware, of a somewhat rare form.



Fig. 55.—Drinking-vessel with the head of an owl.

shall speak further on of these imitations of animate objects, but will content ourselves now with mentioning two of these cups, both from mounds near New Madrid; the handle of the first (fig. 55) is the head of an owl, which is so like those found at Santorin or at Troy, that they might be mistaken the one for the other; the second (fig. 56) is of

¹ A basin exactly similar has been found in the pre-historic camp of Catenoy, Oise, France.

very fine execution, and the handle represents the head of an animal.

We have already stated how very numerous funeral vases are. In certain sepulchral mounds of Missouri, as many as eight hundred or a thousand specimens have been found. It is easy to recognize that they had been used in accordance with some rite consecrated by usage or superstition, and the form varies according to whether the vase was placed near the head, the feet, or the pelvis of the skeleton. This position of the vases has been noted especially at Sandy Woods settlement.¹ In Tennessee, the vases were generally placed at the head of the body; in Mississippi, many contained food prepared for the deceased.



FIG. 56.—Drinking-vessel with the head of an animal.

It is the same in other regions where the food-vessels—such is the characteristic name given to them—are filled with the shells of mollusca, chiefly mussels, or with carbonized fruits, amongst which some wild grapes are supposed to have been recognized. These were doubtless provisions for the great journey. In other graves have been collected now a shell, now a fragment of a bone, now a little vase of ovoid form, simple amulets intended to protect the deceased. Lastly, some urns, which must have contained the ashes of the departed after cremation. One of those found in excavations in Utah shows the form of most frequent occurrence (fig. 105.)

The number of pipes found in mounds is very consider-

¹ W. P. Potter: "Arch. Remains in S. E. Missouri," St. Louis Acad. of Sciences, 1880.

able. We give illustrations of two: one of them, found in a sepulchral chamber in Tennessee, is so like those now in use that they might be taken for each other (fig. 57); the other, a rough imitation of the human figure, comes from a mound in Missouri (fig. 58).



FIG. 57.—Pipe from a sepulchral chamber in Tennessee.



FIG. 58.—Earthenware pipe from Missouri.

Dr. Habel mentions, from near San Salvador, in Central America,¹ two pipes about four inches high, with about the

¹ "Smithsonian Contributions," vol. XXII. The same excavations have yielded a considerable number of pieces of pottery, amongst which is an imitation of an old man's head of fairly remarkable character.

diameter, covered with red and white figures. A hole was made for the introduction of the stem. This is a rare occurrence in these regions, where the use of tobacco was less widespread than among the Mound Builders.¹

Some pieces of pottery represent fruits which, like pumpkins, or pears, are of rounded form. The neck of a vase was often superposed upon such a model. The imi-



fig. 59.—Red vase with neck and a snake coiled about the body, found in excavations in Missouri.

is generally exact, and the artist may have obtained the form by copying or by moulding the fruit before him.

These are not the only imitations which are hidden away in the mounds; the mounds of Missouri and Mississippi have many numerous representations, now of men, now of animals. It is noticeable that such are extremely rare in the New England States.

Amongst the many forms, snakes (fig. 59), bears

lo was the first Spanish writer to mention the use of tobacco. His *Natural Historia de las Indias*, was printed at Toledo in 1529.

(fig. 607), pigs (fig. 61), fish (fig. 62), frogs, turtles very perfectly copied, and birds, including the common brown owl, the long-eared owl and the duck. Ducks especially were carefully studied, and different species are quite recognizable. Surely a very long time must have been required for the art to attain such perfection; generations of artists must have been needed for the creation of the art itself.

We must not omit to mention certain figures of animals often found in the mounds. The head resembles that of our domestic pig; but this animal appears to have been un-



FIG. 60.—Painted vase found in a sepulchral mound in Tennessee.

known before the Spanish conquest.¹ The species most nearly resembling it is the peccary (*Dicotyles*, Cuvier), of the hog family, which has no tail; whilst the creature under notice always has one, and this tail is often turned up. Other authorities think the figure represents the hippopota-

¹ Garcilasso de la Vega ("los Comentarios reales que tratan de l'Origen de los Vncas, Reyes que fueron del Peru," Lisbon, 1609), says that the ancient Peruvians had pigs in their mountains, greatly resembling those of Europe.

but this pachyderm has never, so far as we know, lived in the New World. The object intended is very possibly the sum. The size of these vases varies greatly. Some are small, of yellow earthenware, and covered with zigzag lines in various colors, among which red and white predominate. Others, on the contrary, those found in the State



FIG. 61.—Vase with handles, representing the head of a pig.



FIG. 62.—Vase of a clear yellow color, baked with fire. Missouri.

ermont for instance, are capable of holding over six gal-

The larger ones often have human faces joined to the upper parts of animals. The animals thus represented are, however, as has been supposed, so much alike that they are taken to represent a single characteristic form.

Neither are representations of man wanting. Some, executed with talent, are true portraits, and each one, whatever may be the form of the vase it is intended to decorate, presents a very marked individual character (figs. 63, 64, and 65).



FIG. 63.—Drinking-vase, over $4\frac{1}{2}$ inches high by 9 inches at its greatest diameter.



FIG. 64.—Water-bottle, $8\frac{1}{2}$ inches high, found under a mound near Belmont, Missouri.

The St. Louis museum possesses a bottle, the neck of which has been broken, bearing four medallions representing human figures incrusting in the clay before baking. A vase found

very fruitful excavations at New Madrid also deserves mention. The figures, it is true, are designed without art,



FIG. 65.—Black pottery vase. Missouri.

They are valuable as showing the kind of garments worn by the Mound Builders. The most important represents a



—Figure in black pottery found in Missouri; one third natural size. It is a robe, or, to be more exact, a blouse somewhat like that worn by the French, drawn in at the waist and reach-

ing to the knees. We may also notice another representing a man lying on his back, with the arms and legs roughly imitated. This vase was emptied through a neck springing from the navel of the figure. In a grave of Missouri pieces of pottery have been collected ornamented with designs representing heads, busts, and even the entire bodies of women.



FIG. 67.—Vase found in Missouri. A second face is joined to the back of the first, and the opening is on one side; one fourth natural size.

Side by side with these pieces of pottery thousands of others are found with nothing human about them. There are also caricatures.¹ That most frequently met with represents a crouching woman, with hanging breasts, and arms resting on the knees. The constant repetition of this figure has led to the supposition that it was an idol—one of the malevolent goddesses whose anger had to be averted. But the want of foundation for this conclusion appears in the fact that the vases always have an opening in the back of the

¹Such human caricatures are met with in the most divers localities; among other places the island of Ometepe, Lake Nicaragua, is noted for them. (Figs. 66, 67, and 68.)

head, clearly indicating that they were used as bottles. We may remark that so far but few indecent objects have been found, though they were numerous among the ancient peoples of Europe; reproductions of the sexual organs have rarely come to light,¹ which fact is an important testimony to the morality of these primitive people.

The disposition of the Mound Builders for copying forms which they saw about them is characteristic of many of the American races. So in a less degree is the superiority of their pottery. If indeed the American mound pottery



FIG. 68.—Bottle representing a woman.

be compared with that from the middens of the Lake Dwellers of Switzerland, who are supposed to have reached a similar stage of civilization, one is astonished at the inferiority of the latter. Lately excavations have been made

¹We may instance a few examples: "In altre provincie," said one of the companions of Cortez, "e particularemente in quella di Panuco, adoravano il membro che portano gli huomini fra le gambe."—"Relazione d'alcune cose della Nueva Spagna." Dr. Jones ("Smith. Cont.," vol. XXII.) mentions a phallic pipe and Heywood a phallus found near Chillicothe ("Natural and Aboriginal Hist. of Tennessee," p. 115). Others are also known which came from Alameda county, California. In other places, in Smith county, and in the island of Zapatero, Costa Rica, for instance, idols are spoken of with the *membrum virile in erectione*. Stephens tells of ornaments in several temples of Yucatan representing *membra conjuncta in coitu*. Pieces of Peruvian pottery of the same kind are met with, but they are exceptions. Father Kircher, however, and Bancroft following him, believe in the former existence in America of a Phallic cultus, such as undoubtedly existed in the Old World.

in some tumuli on the practising ground of the school of artillery at Tarbes, on the borders of the departments of des Hautes et Basses Pyrénées, where vases were found dating probably from Gallo-Roman times; they are inferior alike in material, execution, and ornamentation to those of the American races. It is the same with the vases found by Chantre near Samthravo.¹ We content ourselves with these facts, though examples might be multiplied. It is probable that the presence of a good material for pottery had more or less to do with progress in ceramic art, and that the absence of suitable clays accounts in part for the wretched pottery of northeastern American races as it certainly does in the extreme northwest of the continent.

It may be also remarked that the considerable differences in execution between pieces of pottery found in a single undisturbed mound cannot be held to decide that they do not date from the same period, or that the differences observed are due to progress in the manufacture and the natural result of the development of the æsthetic feeling of the people. Probably, we have to deal with the products of the work of more or less skilled or more or less intelligent artisans, with work intended for more or for less important uses, or, and this is a yet simpler explanation, with the pottery of the poor and of the rich. This last is a fact scarcely worth discussing, for it is one belonging to all times and every people.

The early inhabitants of America must have been sturdy smokers,² judging from the number of pipes found in mound excavations. Earthenware pipes have been already mentioned; others were carved of slate, soapstone³ (fig. 69), and

¹ *Revue d'Anthrop.*, April, 1881.

² According to Bancroft (vol. II., p. 288) the Americans, at the time of the Spanish conquest, smoked cigarettes and took snuff. Ameghino (vol. I., p. 354) in his turn says: "Es del dominio publico, que el tabaco, es indigeno de America."

³ A steatite quarry has been examined near Washington, in which the stone had been quarried with quartzite pickaxes; dishes and cups, of which there were many fragments, were made of this stone. This quarry was probably pre-

marble, more frequently still out of a very hard and resistant red or brown porphyry. Some are mere bowls quite primitive in form; others represent various animals, such as the beaver, the otter, deer, bears, the panther, the wildcat (fig. 70), the mud-turtle, the raccoon, squirrels, toads and frogs. Birds are perhaps still more numerous. Amongst them we



FIG. 69.—Soapstone pipe.

may mention herons, hawks, the paroquet, woodpecker, grouse, and the bittern. On a soapstone pipe from Kentucky an armadillo is supposed to have been recognized; and quite recently in Iowa a pipe has been found made of rather soft sandstone, which is claimed to represent an elephant.¹

It is to be observed, however, that such identifications generally owe much to the natural desire to recognize something strange or unusual, and also to the want of a sufficient knowledge of natural history. A recently published in-

Columbian, but the date cannot be fixed. Reynolds: "Aboriginal Soapstone Quarries in the District of Columbia," "Report, Peabody Museum," vol. II,

¹In the *American Antiquarian* (March, 1880), the Rev. S. D. Peet announces the discovery of a pipe which he believes represents an elephant; the supposed trunk is straight and the smoke escapes through a skilfully contrived hole.

vestigation of bird-pipes and carvings by a well-known ornithologist has resulted in demolishing the foundation of much



FIG. 70.—Pipe representing a wildcat.



FIG. 71.—Pipe representing a woodpecker, or wading bird, theorizing which had been based on the identical specimens examined.¹ Forgeries are also too common.

¹ H. W. Henshaw, 2d Annual Rep. Bureau of Ethnology, Washington, 1884.

These designs have often represented the animal in a familiar attitude and display true artistic talent. The heron holds a fish in its mouth, an otter also carries a fish, and a hawk tears a little bird with his claws. Seven heads have been found in the mounds of Ohio which are supposed to represent the walrus or manatee, but are more probably rudely carved otters.



FIG. 72.—Stone pipe, supposed to represent an elephant, found in Louisa county, Iowa.

The toucan, elephant, and armadillo require a warmer climate than that of Ohio or Kentucky; the manatee, so far as the United States are concerned, only lives in Floridian waters, where it is now extremely rare, if not extinct as a resident, though in former times abundant.



FIG. 73.—Pipe found in Ohio, representing a heron holding a fish.

The llama, which has been said to be found sculptured on rocks on the banks of the Susquehanna, belongs to the fauna of the South. All accounts of these animals, in connection with aboriginal relics found in the United States, may therefore be regarded either as wrong identifications of the rudely

carved or mutilated figures referred to, as representing animals with which the carvers had become acquainted either by report or by journeys and migrations, or as forgeries.

At Mound City four pipes have been dug out, each representing a human profile of a very characteristic Indian type.¹ (Fig. 74.) One of them, cut in a very hard and compact black stone, wears a peculiar head-dress. The hair is plaited, and round the forehead were fifteen pearl beads, which had been calcined. The face is covered with incised lines, forming regular tattooing, the mouth is compressed, the eyes are



FIG. 74.—Pipes found at Mound City.

large, the ears are pierced. Another type represents a woman, and may be compared as far as execution goes with the Mexican and Peruvian sculptures.² A pipe from Connecticut represents the bust of a woman, with the wrists and shoulders laden with ornaments; another, found in

¹ Schenckel, vol. I, pl. xii.

² See Garcilaso de la Vega, Book VI., p. 187. Peter Martyr d' Anghiera:

"De Nova Orbis," Déd. 187. Clavigero: "Hist. Antigua de Mejico," 2 vols., 8°, London, 1826.

Virginia, presents a type which may be compared with the antique Egyptian; and yet another pipe from Missouri, in very hard sandstone, represents a man's head, with a pointed beard somewhat like that seen in the Assyrian monoliths of the British Museum.¹ Finally, one of these pipes, discovered in Indiana, and the last we shall mention, has on one side a death's head, and on the other that of a goose.

It was long supposed that the Mound Builders applied their lips to the hole made in the lower part of the bowl, and thus inhaled the smoke; but numerous discoveries have modified this opinion. It cannot be doubted that wooden stems were used, which, of course, would decay and leave no traces. In several places steatite stems have been found,² and Professor Andrews mentions others in earthenware, stone, and copper, which he found in Ohio.³ In California they are still more numerous,—even remains of wooden stems have been found; and the Peabody Museum possesses one such tube from Massachusetts. Long ago, Squier spoke of similar stems in the Mississippi valley,⁴ and bone tubes have been found as far north as Canada. At Swanton, Vermont,⁵ an old burial-place has been discovered, in the midst of a forest where venerable trees replaced others yet more ancient. Here the excavations yielded numerous copper tubes, the length of which varied from three to four inches. The sheet of copper had been drawn out, beaten, and rolled in a manner giving a very high idea of the skill of the workman. Some tubes again are of stone, without ornament; on one, however, a bird is engraved (fig. 75) resembling a spread eagle.⁶

¹ *Am. Ant.*, Jan., 1881.

² Schoolcraft, vol. I., p. 93, pl. xxxii. and xxxiii.

³ "Explorations of Mounds in S. E., Ohio," "Report, Peabody Museum," 1877.

⁴ "Ancient Monuments of the Mississippi Valley," "Smith. Cont.," vol. I., p. 224, fig. 122, 125.

⁵ G. H. Perkins: "On an Ancient Burial-ground in Swanton, Vermont," "Rep. Am. Assoc.," Portland, 1873.

⁶ Beneath the bird three little marks can easily be made out.—(*American Antiq.*, March, 1880). These have been supposed to be letters; but nothing

What was the use of these tubes, met with in such different places? Putnam thinks that a great many of them were the stems of pipes,¹ other authorities look upon them as instruments of music; several of them, notably those found at Swanton, are, however, not pierced, which contradicts both hypotheses and, on the assumption that they were finished implements, leaves us in complete uncertainty. Rau thinks these tubes were used in the operations of medicine-men or sorcerers, so numerous in Indian tribes, and the German traveller, Köhl, states that he saw a medicine-man use the hollow bone of a wild goose to operate on his patient.



FIG. 75.—Bird engraved on a stone tube from Swanton, Vermont.

We have dwelt on every thing relating to pipes, because, after the pottery, they are the most important objects hitherto found, and also because this taste for modelling men or animals is very remarkable.

Besides the human figures used as ornaments on pottery or pipes, we meet with others, which have been taken for images of divinities supposed to be adored by the early in-

as yet justifies us in supposing that the Mound Builders were sufficiently advanced in civilization to have an alphabet.

¹ This was also Squier's opinion after his discovery at Chillicothe of a tube carved in slate, thirteen inches long, ending in a mouthpiece. "Ancient Mon. of the Mississippi Valley." See also Cortereal, "Voy. aux Indes occidentales." Amsterdam, 1722, vol. I., p. 39.

habitants of North America. In Tennessee¹ many stone, steatite, sandstone, and terra-cotta figures have been found; in Knox county, an image hewn out of stalactite, about twenty inches in height and weighing over thirty-seven pounds.

A female figure was discovered in the Cumberland valley, sculptured of brown sandstone, eleven inches high, with the sexual organs very prominent; in Honduras and Guatemala have been found numerous terra-cotta statuettes, called *mañecas* by the present inhabitants. All these figures are of somewhat similar type, and their execution is always coarse, contrasting unfavorably with that of the pottery and other carvings. A good many fraudulent figures have turned up from time to time in the United States, and the authenticity of any such image always requires careful verification. These forgeries are the more dangerous since the authors of them often arrange that they shall be "accidentally" found by some person whose good faith cannot be questioned.

In some "altar mounds" in Anderson township, near the Little Miami River, Ohio, Metz and Putnam found some very remarkable objects in 1882. These "altars" are basins of clay burned hard, *in situ*, and on them have been found thousands of articles which had been thrown into the fire as offerings or sacrifices. Besides native copper, silver, and a very little native gold, all hammered into various shapes, a considerable amount of meteoric iron, of the variety known as pallasite, was found on these altars. There were ornaments of bone, mica, shell disks, canine teeth of the bear and other animals, about half a bushel of pearls (recalling the story of De Soto's chronicler), and about thirty of the spool-shaped copper ear-plugs. On one altar were found several terra-cotta figurines quite unlike any thing hitherto found in the mounds. They are artistically superior to any figure-work yet noted by American aborigines, and were doubtless

¹ Jones: "Smith. Cont.," vol. XXII., p. 128. It is interesting to remember that these supposed idols are of the same type as some of the figures made by the Toltecs.

1375

[illegible]

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after having first rough-hewn the stone with the help of obsidian implements. It was natural that the owners of objects so laboriously obtained should attach very great value to them, and we do in fact meet with pipes mended with extreme care. The process was very simple: holes were pierced at the edges of the fracture, and little rivets of wood or copper were placed in them to keep the pieces together.

Weapons which belonged to the Mound Builders are more rare, and if the extent and importance of their fortifications had not revealed to us the dangers which threatened them, we might have supposed them to have been a peaceful race, entirely devoted to agriculture or commerce. We can however refer to some very finely executed arrow-points,¹ lance-heads, and daggers. In some places regular magazines have been found, where numerous spear-heads have been collected.

We give illustrations of a couple of serpentine hatchets (figs. 76 and 77), from among a number which are so like the neolithic implements of Europe that they might be taken for each other. Squier tells us that this resemblance is so striking as to lead at first to the conclusion that they are the work of men of the same race; which conclusion would, he thinks, be irresistible if we did not know that the wants of man are everywhere the same, and have everywhere led him to give to his implements the same form, and to use them in the same manner. Similar implements are barely out of use in the more remote parts of Alaska.

Many knives or daggers are of obsidian, (the *Itzli* of the Mexicans) which is a glass of volcanic origin and was known in the most remote ages. Pliny (book XXXVI., ch. XXXI.) says that the first fragments were found in Ethiopia by Obsidius, hence the name by which it is known. Great quantities have been found in Mexico, and it is known from

¹ Lucien Carr (Exploration of a Mound, Lee county, Virginia; "Report, Peabody Museum," vol. II., p. 90) gives illustrations of a quartzite lance-point and a chalcedony dagger.

Alaska to Patagonia. In pre-historic times not only weapons were made of it, but also jewels, ornaments, and even looking-glasses.

The Mexicans, according to Clavigero, were such expert workmen that they were able to turn out a hundred obsidian knives in an hour, which is very probable, as they were hardly more than elongated flakes of the glassy material. The Mexicans also inserted a double row of bits of obsidian



FIGS. 76 and 77.—Serpentine axes.
A.—Beard's Mound, Ohio. B.—Hill Mound, Ohio.



FIG. 78.—Serpentine implement found beneath a mound near Big Harpeth River, Tennessee.

in handles of very hard wood, and fastened them in with cord and gum. This weapon was wielded with both hands, and the Spanish historians speak of the terrible havoc it wrought. The *Mahquahwitl*, as this weapon is called, is sculptured on a door-post at Kabah, Yucatan.¹ Judging from the fragments of obsidian arranged in regular rows, occasionally met with in graves, the Mound Builders may have had a very similar weapon.

¹ Bancroft, vol. IV., p. 210.

It is almost impossible to distinguish between the weapons and implements of these primitive times. Hass describes a number of tools fashioned in amphibolite, quartzite, jadeite, and granite, all well made.¹ Besides these we hear of shell fish-hooks, knives, borers, harpoons, and bone, horn, or deer-horn needles.² We give illustrations of two implements of peculiar form, unknown in Europe. The first (fig. 78) is of serpentine, eighteen inches long, and carefully polished. It was found under a mound near Big Harpeth River, Tennessee. Similar implements have been found in the Cumberland valley; others from South Carolina are in the National Museum at Washington; their use is unknown. The second of which we give an illustration is of quartz, and comes from New Jersey (fig. 79). This form is frequently met with in America, especially in Ohio, Wisconsin, Pennsylvania, and the State of New York.³ Probably some of these implements were used in tilling the ground; in Utah, for instance, hewn stones have been found of considerable size, with horn handles, supposed to have been agricultural implements. Schumacher ("Report, Peabody Museum," vol. II., p. 271) speaks of one of these implements measuring fourteen inches long by five wide.



In describing the mounds, we have spoken of numerous objects which served either as ornaments of the deceased or as burial offerings. These ornaments greatly resemble each other in every region where artificial mounds have been erect-

FIG. 79.—Flint instrument from New Jersey.

¹ "Arch. of the Mississippi Valley," Rep. Am. Assoc., Chicago, 1868.

² Potter: "Arch. Remains in S. E. Missouri," St. Louis Acad. of Sciences, 1880. Rau: "Smith. Contr.," vol. XXII., fig. 236, et seq.

³ Rau: "Arch. Coll. of the U. S. Nat. Museum," Washington, 1876, fig. 99.

in Tennessee on one of which (fig. 80) four birds' heads can be made out; the edges of the second are elegantly carved. The St. Louis Museum owns many similar shells; on one of them is engraved a huge spider. On others an attempt has been made to represent human figures, and even scenes from life, such as a battle in which the conqueror, sword in hand, has his foot on the breast of his adversary. In a prehistoric grave of Mackinac Island between Lakes Michigan



FIG. 80.—Shell ornament from Tennessee.

and Huron, Robertson found two pendants made of sea shell. These pendants must therefore have been taken across the greater part of North America. Shells were also used to make necklaces, pins, and probably many other things (fig. 81). A very extensive intertribal traffic in such and other articles has doubtless existed in America from remote ages. As recently it has been found that articles from the shores of the Caspian may reach the mouth of the Mackenzie, on the Arctic Sea, in about three years, by barter, via Bering Strait, it is not wonderful that articles from Mexico or Florida should be found in Minnesota or New England.

Among the ornaments affected by the Mound Builders were polished stones, often brought from long distances, and pierced with one or more holes for hanging them up by. Squier has remarked that with the stones from the mounds of Mississippi, the holes for suspension were always pierced at a distance of four-fifths of an inch apart. By a coincidence probably accidental, but certainly curious, the same measure is exactly reproduced on some stones found at Swanton.¹ Of these stones, some are of considerable weight, and sometimes



FIG. 81.—Pin made of shell from Elly Mound, Va.



FIG. 82.—Sculptured stone found at Swanton, Vermont; the base is flat and is pierced with two holes for suspension. Length $3\frac{1}{2}$ inches.

exceed two pounds; some represent animals (fig. 82) chiefly birds, almost always roughly hewn. A fragment of white marble is mentioned in which the parts the artist wished especially to accentuate are colored red. It would indeed be difficult to enumerate all the varieties which have rewarded excavations.

We must not omit to mention the metallic ornaments of the Mound Builders. At Connett's Mound more than five

¹ G. H. Perkins: "On an Ancient Burial Ground in Swanton, Vermont," *Am. Assoc.*, Portland, 1873.

hundred copper beads (fig. 83) have been collected. These beads were intended to make bracelets or necklaces.

At Circular Mound, near the Detroit River, some similar beads were threaded on a string made of bark. They had been shaped from a thin sheet of copper, first cut out and then rolled without any trace of soldering.¹ In other instances the beads were of oval form, and their manufacture must have presented serious difficulties.

Besides the ornaments just mentioned we meet with celts. A "celt" is an implement of stone or bronze, used sometimes as a weapon, but generally for industrial purposes, performing the office of a chisel or an adze. Celts vary considerably both in shape and size, but usually have the



FIG. 83.—Copper beads from Connett's Mound, Ohio (natural size).

outline of a plane-iron such as carpenters use, though of course much thicker when of stone, and with the cutting edge more or less arched. There are also scrapers, scissors, knives, lance- and arrow-points of different forms, all made by hammering pieces of native copper. To the early and late aborigines of America the malleable properties of copper were well known. At Swanton a copper hatchet was found originally provided with a wooden handle, of which fragments could still be distinguished; in Wisconsin a lance-point and a knife that might be compared with our modern weapons (fig. 84); at Joliet, Illinois, a sharp blade, and at Fort Wayne a knife. On a skeleton discovered beneath a mound at Zollicoffer Hill, a copper ornament of

¹ Andrews: "Expl. in S. E. Ohio." "Report, Peabody Museum," 1877.

quite peculiar form was found.¹ The cross surmounting it led people to suppose it to be of European origin; but Dr.



FIG. 84.—Copper weapons found in Wisconsin.

Jones mentions the same subject as an ornament on some engraved shells and copper objects, also found in Tennessee.² A skeleton taken from one of the Chillicothe mounds bore a cross upon its breast, and a figure with a cross engraved upon its shoulder was discovered beneath a mound in the Cumberland valley. The cross occurs again on one of the bas-reliefs of Palenque, and on the monuments of Cuzco, in the very centre of the worship of the sun. When Grijalva landed in 1518 on the coast of Yucatan, his surprise was great to meet with the sign of his own faith in the temples of the natives.³ Similar instances occur all over the continent of America and are mentioned, though it is impossible to attach any importance to them. The cross is of great antiquity in all countries. It is found on the most ancient monuments of Egypt, where it symbolizes eternal life. It is, moreover, one of the simplest forms of ornament and as such, and as suggested by many flowers and other natural objects, we should expect to find in all parts of the world that it has been made use of by primitive man.

¹ Putnam : "Arch. Expl. in Tennessee." "Rep., Peabody Mus.," 1878, vol. II., p. 307.

² Heywood : "Expl. of the Aboriginal Remains of Tennessee." "Smithsonian Contr.," 1876.

³ Herrera : "Hist. Gen. de los hechos de los Castellanos en las Islas y

The pottery of Missouri and the discoveries of Putnam in the caves of Kentucky have already revealed the nature of the clothing worn by the Mound Builders, and mummies found in the caves of the western states enable us to judge of them still better. The bodies were wrapped in coarse cloth, over which was a kind of net with wide meshes, in which were stuck feathers of brilliant colors, the whole enveloped in a third covering of skin. The ancient inhabitants of America manufactured different kinds of tissues. A few years ago the excavation of a mound near the Great Miami River, two miles north of Middletown, Ohio, yielded several fragments of half-burnt cloth mixed with charcoal, and human bones also injured by fire.¹ This cloth which had been coarsely woven by hand was doubtless used to wrap the body in before cremation, or, at least, the partial burning which preceded interment. It cannot reasonably be attributed to the present Indians, as the mound showed no traces of disturbance.

Other instances confirm what we have just stated. In Iowa some copper axes have been recently discovered carefully wrapped in very well preserved cloth,² and in January, 1876, excavations in a mound in Illinois³ brought to light several turtles in beaten copper of remarkable workmanship. Most of these turtles measure not more than 2 1-8 inches in length, and the copper has been reduced by beating to a thick-



FIG. 85. — Copper ornament found in a stone grave at Zollicoffer Hill, Tenn.

Tierra Firme del mar Oceano." Madrid, 1725-30, Dec. 2d, Book III., chap.

L. The first edition was published in 1605.

¹Foster: "Description of samples of ancient cloth from the mounds of Ohio." "Rep., Am. Assoc.," Albany, 1851.

²Short: "The North Americans of Antiquity," p. 37.

³Bulletin of the Buffalo Society of Natural History, March, 1877.

ness of 1-64 of an inch. These jewels, for such they must be called, evidently of great value, were enveloped successively in a vegetable tissue, some stuff of brown color made of the hair either of the rabbit or some other animal,¹ and lastly in a covering made out of the intestines of some animal. In the same mound were found teeth of a deer perforated for suspension and covered with very thin plates of copper. These teeth were wrapped like the turtles we have just described.

The Ohio mounds, which have afforded results so fruitful for science, have also yielded a very well-preserved piece of skin about eight or ten inches long, ornamented with numerous oval copper beads. This was a fragment of a garment which had belonged to a Mound Builder.²

The copper which the Mound Builders used so frequently came from the shores of Lake Superior.³ The works of ancient miners are scattered over a region 150 miles long and from four to seven miles wide, now called the Trap-zone. Keweenaw Point juts out like a buttress into the lake for a distance of seventy miles, and the mineral deposits which abound there have been worked in remote ages, though all traces had been obliterated, and all memory of the old miners lost, until, in 1848, the work of a mining company laid them bare. The depth of the excavations, which were always open to the sky, varied from twenty to thirty feet, the latter forming the extreme limit to which these inexperienced workmen dared to penetrate, and the copper was found in masses varying from a few ounces to thousands of pounds. In one mine, which had been choked up in the

¹ Examination with the microscope has not succeeded in satisfactorily determining the nature of this hair. It is known, however, that the Nahuas manufactured a tissue as fine as silk out of rabbit's hair.

² School-house Mound, Ohio. Andrews: "Report, Peabody Museum," vol. II., p. 65.

³ C. Jackson: "Geological Report to the U. S. Government," 1849. Foster and Whitney: "Report on the Geology of the Lake Superior Region," part I, 1850. Ch. Whittlesey: "Ancient Mining on the Shores of Lake Superior"; Am. Assoc., Montreal, Canada, 1857. Swineford: "Review of the Mineral Resources of Lake Superior," 1876.

course of years with earth and vegetable refuse, the remains of several generations of trees, was found, at about eighteen feet from the surface, a block of metal measuring two feet long by three wide and two thick, and weighing nearly six tons. This mass had been placed on rollers from six to eight inches in diameter, the edges of which still bore the marks of a sharp instrument. The miners had rolled the mass up about five feet, and then they had abandoned an undertaking beyond their strength or the means at their disposal. Their mining processes were very simple; the workmen lighted great fires in the mine, and when the rock had become friable they broke it with powerful blows of a stone hammer or mallet. Several of the mallets used have been found, the heaviest weighing as much as thirty-six pounds; also a great number of small serpentine or porphyry hammers. Knapp, who was the first to direct these excavations, states that he took out from these mines ten cart-loads of stone implements of all kinds. In an unusually deep excavation, a quite primitive ladder was found, consisting of the trunk of a young tree, with the branches cut at unequal distances to serve as rungs. In other places shovels, levers, and dippers of cedar wood were discovered, preserved from destruction by the water in which they were soaked. Everywhere copper implements were found side by side with stone, mostly bearing marks of long service. One mallet weighed more than twenty pounds. Like all the other copper objects it had been made by hammering unheated.

Various analyses of the copper of Lake Superior have proved its identity with that collected from the mounds. Both yield the same proportion of silver, and we know that the latter metal is always present with copper in varying quantities.

The deposits of Isle Royal, Lake Superior, were even richer than those of Keweenaw Point.¹ They extended for a distance of forty miles, and the ground was riddled with ancient excavations dug out to get at the ore. It has been

¹ H. Gillman: "Ancient Works of Isle Royal." "Smith. Cont.," 1873.

estimated that the vegetation rising from the old mining works of the Great Lakes represent an approximate duration of several centuries. But we have already referred to the uncertain character of what may be called vegetable evidence.

Traces of native mining operations have been found in several other parts of North America, in Arkansas, Missouri, and on the slopes of the Ozark Mountains, for instance.¹ There were also copper mines in Mexico,² but there is nothing to show when they were worked. Captain Peck noticed near the Ontonagon River, in northern Michigan, at a depth of twenty-five feet, some sledges and other tools in contact with a vein of copper.³ A little above them lay the fallen trunk of an old cedar; the roots of a fir in full vigor surrounded the cedar. This fir was estimated to be at least a hundred years old, and to that time must be added the age of the cedar it had replaced, with the yet longer period necessary to the filling up of the abandoned cutting by the slow accumulations of successive winters, which supplied the trees with the vegetable earth necessary to their growth.

Copper seems to have been the only metal in common use amongst the Mound Builders. Few well authenticated discoveries of gold are known; silver was rare, and so far has been found chiefly under some mounds of Mound City, in very thin leaves covering shells or copper ornaments, and this plating is so well done that the work of the artificer can only be made out with difficulty. This silver must have come from Lake Superior, where it is found associated with native copper in a metallic state.

It has been generally supposed that iron was unknown,⁴ and in numerous excavations made at many different points and in many different regions, not a scrap of it has been found. We have previously mentioned the recent and authentic discovery of meteoric iron by Putnam and Metz in

¹ Behanckraft: "Archives of Aboriginal Knowledge," vol. I., p. 101.

² F. von Hellwald: "Congrès des Américanistes," Luxembourg, 1877.

³ Lubbock: "Prehistoric Times," p. 289.

⁴ Iron ore and galena occur, but no iron or lead, Bancroft, vol. IV., p. 778.

the Little Miami mounds, which show that it was considered very valuable, since copper ornaments were plated with it as others were with gold or silver. Previous statements with regard to the discovery of iron in the mounds are, without exception, unsatisfactory.

The Mound Builders are supposed to have been quite ignorant of any process of fusing metals,¹ and their weapons, or implements of copper, were, as we have more than once remarked, shaped by hammering. A recent discovery, however, is claimed to modify this opinion and to prove that in one place at least the Mound Builders understood the art of smelting metals. Some recent excavations in Wisconsin have yielded not only implements of copper, but the very moulds in which they are supposed to have been cast. It is desirable that other facts should confirm an assertion upsetting the hitherto generally received opinion.² It has been held by some and with much probability, that the moulds were used in the process of shaping cold copper, a piece of approximately similar form having been put into the mould and hammered until it took the shape of the cavity. The experiment was successfully tried by Dr. Hoy with one of the stone moulds.

Traces of cultivation attributed to the Mound Builders are numerous in the western states, especially in Michigan and Indiana.³ These are parallel embankments, which often cover a considerable area, several acres for instance, to which have been given the significant name of *Garden-beds*. We meet with similar embankments in Missouri and in all the

¹ There is no evidence that metal was ever obtained from ore by smelting. The Mound Builders were ignorant of the arts of casting, welding, and alloying. Bancroft, vol. IV., p. 778.

² The above was written when I heard of a letter from Putnam, of Nov. 17, 1881, called "*Were ancient implements hammered or moulded into shape?*" The learned professor concludes with me that there is so far no serious proof of the use of moulding. "Besides beating," adds Putnam, "these men employed one other process; the metal was rolled between two flat stones, by which means the required form was obtained."

³ Schoolcraft: "*Ancient Garden-Beds in Grand River Valley*" (Michigan), vol. I., p. 50, and pl. VI. Conant, p. 65.

districts west of the Mississippi; they extend into the valleys of the Ozark Mountains, from Pulaski county to the Gulf of Mexico on the south, to the banks of the Colorado and to Texas on the west, and to Iowa on the north. Their diameter varies from ten to sixty feet, and their height from two to three feet. Numerous and detailed excavations have yielded no relic, no bone, no fragment of pottery, no heap of cinders or of coal that could witness to the residence or the burial of man. They cannot therefore be compared either with the kitchen middens or the sepulchral mounds.

Professor Forshey attests their presence in Louisiana, where they are of considerably larger dimensions, their diameter varying from thirty to one hundred and forty feet. It should be added that the diameter of one hundred and forty feet is an isolated case. Their greatest height is five feet, which diminishes to a few inches in the vast marshes stretching away from the shores of the Gulf of Mexico. At certain points these embankments touch each other, and between Galveston and Houston, between the Red River and Wichita, they can be counted by thousands. According to Forshey, who described them to the New Orleans Academy of Sciences, these embankments cannot have served as the foundations of the homes of men. He remarked that none of the known burrowing animals execute such works, whilst hurricanes could not have accumulated materials with such regularity. He added that in his opinion it was impossible to say any thing definite with regard to their origin, which seemed to him inexplicable. Other archæologists are more positive; they consider that these embankments could have been used for nothing but cultivation, and that they were intended to counteract the humidity of the soil, still the greatest obstacle with which the tillers of the rich plains of the lower Mississippi valley have to contend.

According to certain authorities the Mound Builders cultivated maize, *frijoles* or black kidney beans, introduced by the Spaniards into Europe, and even the vine. A recent explorer, Amasa Potter, in describing the excavations of a

mound in Utah, tells of having found a handful of corn, a few grains of which carefully collected and planted yielded the following year an ear of exceptional length, containing a number of grains of a shape quite distinct from that of any cereal of to-day; but the whole account of this discovery is so extraordinary that it is impossible to accept it.

To sum up: the vast region between the Mississippi on the west and the Alleghanies on the east and between the Ohio on the north and the Gulf of Mexico on the south, was occupied for centuries, the exact number of which it is impossible to estimate in the present state of our knowledge, by man. Judging from the number of structures left to bear witness, this population was numerous; tolerably homogeneous, for everywhere we recognize similar funeral rites, and much the same arts and industries; sedentary, for nomads would not have erected such temples or constructed such intrenchments; pastoral and agricultural, for the chase could not have supplied all their needs; subject to chiefs, for a despotic authority must have been indispensable to the erection of the works left behind them; and lastly they must have been traders, for beneath the same mounds we find the copper of Lake Superior, the mica of the Alleghanies, the obsidian of Mexico, and the pearls and shells of the Gulf. All testify to the fact that the men, whose traces we are seeking, had long since risen from the barbarism of savagery, and that they had attained to a state of comparative culture. It is certain that, as with all the savage races whose evolution history enables us to follow, this culture could only have been acquired slowly and by degrees.

What then, we must now ask, were the men, whose works so justly excite our astonishment? Did the Mound Builders disappear? Were they aboriginal, or were their architecture, their industrial art, and their agriculture of foreign origin? If they migrated from neighboring regions, or from distant continents, what were those regions and what those continents? By what route did they travel, and if they disappeared how was it that all recollection of their disappearance

was effaced from the memory of their conquerors or their successors? It is impossible to disguise either the bearing of these questions on the development of the American races; or the fact that at present we can but partially solve them. The conditions of the problem and the opinions which have been successively enounced may be briefly stated.

Those who have made this subject their special study have been divided into two parties, and religious prejudice has even been invoked to aggravate the difficulties already in themselves so great. To the most recent and cautious investigators the Indians at the time of the conquest represent in a general way the so called Mound Builders, while others, on the contrary, assert that the builders of the great mounds have completely disappeared, and these persons absolutely refuse to admit the possibility of the native races of North America being their descendants. We must examine in turn the arguments and objections which are not wanting for or against any of the theories put forth.

One thing is certain: The analogy between the mounds is such that they cannot but be the work of a people in about the same stage of culture. "They are all built by one people," observes Conant, on p. 39 of his "*Footprints of Vanished Races*," and it is not less certain that centuries may have been required for their erection. The men who worked the mines of Lake Superior, who erected such mounds as those of Newark, Portsmouth, Cincinnati, Chillicothe, and Circleville, and such fortifications as those of Ohio, must long have dwelt in these regions, though it is impossible to fix the limits of their occupation. The question of the time of their residence is so intimately connected with that of their origin, that it is impossible to separate them.

One preliminary remark must be made: in the caves and beneath the tumuli of Europe have been found numerous well-preserved human bones, often dating from the most remote antiquity, while this is less commonly the case in America. These excavations have often yielded, as the last

vestiges of the human body, but a few little heaps of white dust; though hundreds of skeletons have been taken out, but a small proportion of them have been treated with the care necessary to their preservation.

It has also been noticed that mounds are rarely met with in the lower levels¹ of the districts watered by the Ohio or its tributaries. These structures nearly all rise from terraces formed by ancient alluvial deposits, and some have retained to this day traces of great inundations which altered the valleys. It is likely that their builders chose their sites so as to avoid the great floods, the disastrous effects of which they must have annually experienced at the outset. Recent discoveries enable us to add that some of the mounds rise from the most recent alluvial deposits. This fact would prove that the erection of mounds went on for centuries.

The giants of the forest have covered many of the artificial earthworks, and generations of tree in their turn succeeded the residence of man. Such changes surely needed a long period of time. "The process by which nature restores the forest to its original state, after being once cleared, is extremely slow," says General Harrison² in a speech already quoted. "The rich lands of the West are, indeed, soon covered again, but the character of the growth is entirely different, and continues so for a long period. In several places upon the Ohio, and upon the farm which I occupy, clearings were made in the first settlement of the country, and consequently abandoned and suffered to grow up. Some of these new forests are now sure of fifty years' growth, but they have made so little progress toward attaining the appearance of the immediately contiguous forest as to induce any man of reflection to determine that at least ten times fifty years must elapse before their complete

¹ The difference of level between the high and low water is thirty-five feet for the Upper Mississippi, from thirty to thirty-five for the Missouri, and forty-two for the Ohio.

² "Trans. Hist. Soc. of Ohio," vol. I., p. 263. See also "Arch. Americana," vol. I., p. 306; and Squier and Davis' "Ancient Monuments of the Mississippi Valley," 1848, p. 306.

indicate for their builders, that the Indians could not or would not dig canals, hammer copper into utensils, or make such pottery as that found in the mounds. It is also said that the Indians have no traditions in regard to the mounds, or ascribe them to a foreign race or to some mythical people, and have no reverence for them such as would be expected if the works were the tombs of their ancestors.

Of these arguments it may be said that there is hardly one of them which has not already been refuted by scientific researches of recent days, and most of them would never have been offered if the persons who advanced them had had our present knowledge of the American races, the mounds, and the methods of scientific archæology. This is no reproach to the early investigators. Archæology as a science is young, and yet those who depend upon many of the early writers for their general principles are in the position of the blind led by the blind.

It should, however, be distinctly understood that the reference to "Indians" in connection with the mounds, is a strictly general term. The richest, most cultured, and most sedentary of the Indian tribes existing when the white race poured into America like a resistless flood, have been destroyed; of many tribes none remain. Of others only a most feeble remnant exists or lately existed in a region to which they have been exiled from the lands of their fathers. Those who constitute the greater portion of our Indian population to-day are those who were nomads, wanderers, the Bedouins of America, the idle wanderers who were not tied to the soil by their progress in culture, and who probably never troubled themselves about mounds as long as they could shift their wigwams from one good hunting ground to another. It is of these that one thinks as Indians when the contrast between Mound Builder and Indian is mooted. Again, even among those who were not of the nomadic category there is no doubt that their facility in many aboriginal arts wilted before the sun of civilization, while the methods and tools of the white man, like foreign weeds,

sprang up in the vacant place. Why spend hours of making fragile, if artistic, pots when an otter skin purchase three good kettles outlasting a wilderness of? Why wearily weave the macerated fibres of wild herbs a coarse, unsightly fabric when a basket of wild berries would sell to the white man for a fathom of bright cloth? The Indian, whatever romance may be reflected upon by the novelist in trying to hold the mirror up to nature in business matters, as he understands them, severely practical. The white man's tools, fabrics, weapons, kettles, the better ones, and the Indian adopts them. After centuries of this sort of thing why should the disappearance of many historically recorded aboriginal methods astonish?

It is also to be remembered that America holds peoples of different culture and habits. We know that some of them are ultimately related though put in various linguistic families. Were their heaps of refuse and the ruins of their villages their only record, who would claim kinship between the Pueblos of the South and the fishing Indians of Canada? the Northern Tinneh and the Apache, or other contemporaries? These reservations made, the legend of the mounds becomes less misty.

Although it is true that we meet with no structures among the Indians of the extreme north which at all recall those of the Mound Builders, and although the laziness of the present time is so indomitable that the origins of the present time is so indomitable that the present often not even dreamed of turning the mounds to account for the burial of their own dead, facts of a different kind are quoted with regard to other regions. The Kickapoos in southern Illinois, and the Shawnees, who dwelt near Nashville, buried their dead, until quite recent times, in stone graves. This fact, we must add, has been called in question, especially by Carr in his "Observations on the Crania from the Stone Graves of Tennessee,"¹ and, if true, there is nothing to prove that the Indians did not use sepulchral chambers dating from before their arrival in the locality.

¹ "Report, Peabody Museum," vol. II., pp. 361, etc.

The testimony of the Spanish historians is more important. Garcilasso de la Vega¹ tells of the Indian mode of founding a town at the time of the conquest. According to him the Indians collected large quantities of earth with which they formed a platform many feet in height, large enough to hold from ten to twelve houses, or if necessary fifteen to twenty. There dwelt the chief, his family and his chief attendants. At the foot of the mound a square was marked out, of the size the town was to be; the principal chiefs took up their residences in it, and the common people gathered about them. Further on, Garcilasso² described the town of Guachoulé near the source of the Coosa, not far from the country of the Achalaques, part of the Cherokee tribe, in which the house of the chief was erected on an eminence terminating in a platform, on which six men could stand upright.

The confirmatory testimony of early explorers shows that the valley of the Mississippi, as well as the districts now forming the states of Ohio, Florida, and Georgia, was inhabited by warlike nations, who tilled the ground, lived in fortified towns, erected their temples on eminences, often artificial, and worshipped the sun. These were the men who repulsed Narvaez when he endeavored to conquer Florida in 1528. It is but fair to remark that Narvaez' army consisted of but 400 foot soldiers and twenty cavalry, though provided with civilized weapons. It was against them that Hernandez de Soto fought for four years, giving them battle with great slaughter in Florida, Georgia, Tennessee, Mississippi, Alabama, and Arkansas. Everywhere he found a numerous population. The towns were surrounded with walls of earth, and towers strengthened the broad trenches which completed the defences. At Pascha, west of the Mississippi, for instance, the Spaniards found a fortified town surrounded

¹ "Hist. de la Conquête de la Floride, ou Relation de ce qui s'est passé au voyage de Ferdinand de Soto pour la Conquête de ce pays." La Haye, 1735, vol. I., p. 136.

² Vol I., p. 294. See also A. J. Pickett, "History of Alabama," Charleston, 1857, vol. I., p. 8.

by a trench sufficiently wide for two canoes to float in it abreast. This trench was nine miles long and communicated with the Mississippi.

Squier in his turn tells of finding among the Creeks, Natchez, and other tribes of the south, traces of structures which, if they do not exactly resemble the regular enclosures of the west, seem at least to have some analogy with them, and the description we borrow from him of the *Chunk Yards*¹ is certainly a fresh proof in favor of the opinion he advances.

"The *Chunk Yards*² are rectangular areas, generally occupying the centre of the town, enclosed and having an entrance at each end. The public square and rotunda, or great winter council-house, stand at the two opposite corners of them. They are generally very extensive, especially in older towns. Some of them are 600 to 900 feet in length and of proportionate breadth. The area is levelled, and sunk two, or sometimes three feet below the banks or terraces surrounding them, which are occasionally two in number, one behind and above the other, and composed of earth taken from the area at the time of its formation. These banks or terraces served the purpose of seats for spectators. In the centre of the yard or area there is a low circular mound or eminence, in the middle of which stands the '*Chunk Pole*,' which is a high obelisk or four-square pillar, tapering upward to an obtuse point. This is of wood, the

¹ "Ancient Monuments of the Mississippi Valley," p. 121.

² Their name is derived from an Indian game. Catlin describes it among the Mandans and gives it the name of *Tchungkee* ("Illustrations of the Manners, Customs, and Conditions of the North American Indians," London, 1866, vol. I., p. 132). Adair had already described the *Chung kee* among the Cherokees ("Hist. of the Am. Indians," London, 1775, p. 401). Jones met with the same game among the Indians of the South ("Antiquities of the Southern Indians"), and Bartram among those of Carolina. Carr gives an illustration of a carefully polished sandstone of elliptical form measuring about four inches at its widest part and nearly two and three fourths thick. This stone was found under Ely Mound, Virginia, and similar ones have been met with in various places. They are supposed to have been used in the favorite game of the Indians.

heart or inward resinous part of a sound pine-tree, which is very durable. It is generally from thirty to forty feet in length, and to the top is fastened some object which serves as a mark to shoot at, with arrows or the rifle, at certain appointed times. Near each corner of one end of the yard stands erect a smaller pole or pillar, about twelve feet high, called the 'Slave Post,' for the reason that to them are bound the captives condemned to be burned. These posts are usually decorated with the scalps of slain enemies, suspended by strings from the top. They are often crowned with the white dry skull of an enemy." * * * * * Further on the same author describes "a circular eminence, at one end of the yard, commonly nine or ten feet higher than the ground round about. Upon this mound stands the great rotunda, hot-house, or winter council-house, of the present Creeks. It was probably designed and used by the ancients who constructed it for the same purpose. * * * A square terrace or eminence, about the same height with the circular one just described, occupies a position at the other end of the yard. Upon this stands the Public Square."¹

Recent discoveries confirm this account.² Under a conical mound measuring 19 feet high by 300 feet in circumference at the base, in Lee county, Virginia, were found a number of posts of cedar wood, arranged at regular intervals so as to form a circle, with a much higher one in the centre doubtless intended to hold up the roof or covering. This was the council-chamber, the assembly-room, of the tribe, greatly resembling that of which Bartram, quoted above, writing in the last century, gives a description. "The council or town house," he says, speaking of that of the Cherokees, "is a large rotunda, capable of accommodating

¹ These extracts, which are taken from Squier and Davis' "Ancient Monuments of the Mississippi Valley," pp. 121-123, are in reality quotations by these authors, taken with others from a MS. by W. Bartram, author of "Travels in North and South Carolina." "The Ancient Monuments of the Mississippi Valley" will be found in vol. I. of the "Smithsonian Contributions to Knowledge," published by the Smithsonian Institution, at Washington, in 1848.

² "Report of Peabody Museum," vol. II. p. 75, etc.

several hundred people ; it stands on the top of an ancient artificial mount of about twenty feet perpendicular, and the rotunda on the top of it being about thirty feet more gives the whole fabric an elevation of about fifty feet from the common surface of the ground ; but it may be proper to observe that this mount, on which the rotunda stands, is of much more ancient date than the building, and perhaps was raised for another purpose. The Cherokees themselves are as ignorant as we are as to by what people or for what purpose these artificial hills were raised ; they have various stories concerning them."

The Indians of the South then not only used the ancient mounds for the houses of their chiefs, or for their council chambers, but they also erected similar mounds in their own chunk yards. These facts greatly modified Squier's first impressions, and led him, as he himself tells us, to a conclusion he little expected when he began his researches. In his last studies he decided that the earthworks in the western portion of the state of New York were erected by the Iroquois, and that their erection only preceded their discovery by a short time. He adds, it is true, that in the 16th century there was not a single Indian tribe between the Atlantic and the Pacific, except the half-civilized people of the South, who had sufficient means of subsistence to be able to give up time to unproductive labor ; nor was there one tribe in such a social condition as would admit of the compulsory erection by the people of the structures under notice. Subsequent researches have removed many of the supposed difficulties, and are well summarized by Lucie Carr in the paper from which we have already quoted.

Southall dwells on the facts which seem to him to prove not only an Indian origin for the mounds, but also their recent construction.¹ His work describes the Iroquois government which included five nations. These were the Mohawks, also called in some French narratives the Agniers, the Oneidas, the Onondagas, the Cayugas, and the Senecas, c

¹ "Recent Origin of Man," ch. xxxvi., p. 530 et seq.

Tsonontouas. According to the Jesuit fathers these nations numbered in 1665, 2340 warriors or altogether 11,700 souls, according to the generally accepted method of estimating such populations.

They devoted themselves to agriculture, and were able for nearly two centuries to maintain their independence against the Dutch and French. Their territory stretched from the St. Lawrence to Tennessee and Ohio; they were not ignorant of navigation, and early travellers report having seen their canoes as far southeast as Chesapeake Bay. Since then they have given up their nomad habits and we have some very exact descriptions of their villages and dwellings.¹

It was the same in many other parts of the country. Strachey, travelling in Virginia at the beginning of the 17th century,² relates that he found the Indians living in houses made of wood, cultivating maize and tobacco, and harvesting peas, kidney-beans, and fruit. The Mandans, dwelling on the upper Missouri, not far from the mouth of the Yellowstone River, dug out earth for a depth of about two feet, and built their huts in the hollows thus obtained. These huts, which were of circular form, made of solid materials and roofed in with turf, were from about thirty to forty feet in diameter. Several families lived together; the beds, which were ranged round the circular walls, had curtains of dressed deer-skin. The Iroquois, Natchez, Delawares, and Indians of Florida and Louisiana made vases, the ornamentation and delicacy of which were not in any way inferior to the pottery of the Mound Builders, and the curious pipes, of which we have spoken, are met with among the Indians of the present day.

Lastly, two centuries ago, when French missionaries first visited the districts bordering on Lake Superior, the Chipewas used copper weapons and tools. These facts, with many others which might be quoted, would appear to justify

¹ See especially the account by Greenhalgh who visited several Seneca villages in 1677, and Morgan's "League of the Iroquois."

² "Historie of Travaile into Virginia Britannia" (written in 1618).

a belief that the Indians once possessed a civilization superior to the condition to which their descendants have been reduced by defeat, invasion, indulgence in too much alcohol, and other causes.

We have given a summary of the different opinions held, and have stated the conclusions to which they lead most modern anthropologists. Some discussion of the physical characters of these races may be useful. The Indians of America have been held to form a distinct variety of the human race. Their skin is swarthy, varying from the pale olive to a warm brown, often with a bright color on the cheeks. The stories of their copper-colored complexion are at least in North America, due to the ridiculous misconception of the early voyagers who took no account of the reddish paint with which they were smeared. Like the whites, their complexion is darkened or burned by the sun sometimes to a considerable degree, but nobody ever saw a naturally copper-colored American Indian; their hair is black and wiry and almost invariably straight; their eyes are black or very dark-brown; their lips are thick or thin, according to the tribe or individual; their forehead is comparatively low; their face is generally long with high cheekbones; their hands and feet are small and often delicately made. These characteristic traits have rarely been known to vary during the three centuries in which they have been in contact with the whites, but marked differences occur between the various tribes as to physiognomy, physique, temperament, personal attractiveness, and tint of complexion. This has been observed by all students of the Indians who have been fortunate enough to have wide experience among them. Much stress has been placed on supposed fundamental differences between the bones of the Mound Builders and those of other American races. These differences were more apparent while the material was scanty, and tend to disappear as we come to know more of the Indians of various parts of America, and to have larger mound material for comparison. It has been said that the Mound Builders are

characterized by a general conformation which places them apart amongst human races, and differentiates them especially from the Indians of North America. For myself, however, I do not attach as much importance as do some eminent anthropologists to differences between bones, especially the bones of skulls. Too often we find beneath the same mound, dating from contemporaneous burials, amidst similar stone implements and pieces of pottery, brachycephalic and dolichocephalic skulls, skulls of the Caucasian, and skulls of almost negroid type. All varieties, from extreme long heads to rounded or nearly square heads have been found among undoubted Eskimo crania.¹ The external conformation of the heads can only be guessed at, and therefore any conclusion might turn out to be premature.

Moreover, however true these assertions may be, there are, as we have previously intimated, Indians and Indians. The Indians of the north should not be confounded with those met with by the Conquistadores in the south, and who were certainly in a much more advanced state of culture. It may be supposed that the wild tribes from the north and the northwest first drove the mound-building people from Illinois and Indiana; that those of Ohio, protected by a solid line of fortified camps or villages, offered a more efficacious resistance, but that they, in their turn, were driven beyond the Mississippi; that the struggle went on in Kentucky and Tennessee, until the day when the remnants of this ancient people were driven back to the districts bordering on the Gulf, where the vanquished were gradually merged with the conquerors, and that thus united they contended bravely and often with success against a foreign yoke.²

Perhaps too it may be possible to meet with traces of

¹ We have mentioned numerous facts leading to a similar conclusion in Europe. See, also, "*Les premiers hommes et les temps pre-historiques*," vol. I., ch. iii., and vol. II., ch. xii.

² Force: *A quelle race appartenaient les Mound Builders* ("*Cong. des Américanistes*," Luxembourg, vol. I., p. 121.)

people akin to the Mound Builders amongst the Aztecs, whose stone *teocallis* resemble the conical mounds in form, and amongst the Mayas,¹ of whose remarkable monuments we shall presently speak, and who also had to contend with formidable enemies.²

There can be no doubt whatever that tribes who were builders of mounds lived in Central America for centuries, but we have no chronological scale by which we can estimate the duration of their residence there, still less determine a definite emigration to or arrival in the valleys of the Mississippi or of the Missouri. The trees growing from the mounds of Ohio are rarely more than one or two hundred years old; while in the valleys of Florida and on the shores of the Gulf of Mexico they are not even so old as that. One conclusion may be drawn: that the mounds had been abandoned when they became overgrown with trees. But were these trees the successors of others, and can we say how many generations have disappeared since the erection of the mounds, or whether the latter were generally contemporaneous? We were met by a similar problem in dealing with the shell heaps and we can only give a similar answer.

From the mounds themselves we can learn nothing. A lapse of thirty centuries or of five would account equally well for the development of the civilization they represent. Stronck ascribes the erection of some of the mounds to the earliest days of our own era, and thinks that some of them must have been abandoned between the sixth and twelfth

¹ Robertson speaks of having disinterred a considerable number of Mound Builders' skulls, and says that they have in every case been of a type somewhat resembling that of the natives of Yucatan ("Congrès des Américanistes," Luxembourg, 1877, vol. I., p. 43.)

² The examinations of the organic and monumental remains, and of the works of art of the aborigines of Tennessee, by Dr. Jones, in his opinion establish the fact that they were not the relics of the nomadic and hunting tribes of Indians such as many known to exist at the time of the first explorations by the white race; but on the contrary that they are the remains of a people more closely related to but not identical with the aborigines of Mexico and Central America, "Smithsonian Contr.," vol. XXII., p. 88.

centuries.¹ The margin, it is evident, is wide. Force,² in fixing on the seventh century as the most flourishing period of these people, and Hellwald,³ in making them contemporary with Charlemagne, would appear to endorse to some extent the hypothesis of Stronck. Short, in an excellent work on the North American Indians, tells us that one or at the most two thousand years only can have elapsed since the Mound Builders were compelled to abandon the valleys of the Ohio and its tributaries, and but seven or eight hundred since they retired from the shores of the Gulf of Mexico. Lastly the early explorers found mounds occupied and even being constructed within the last few hundred years. So we must content ourselves with the conclusion that, whatever the period of their initiation, it is probable that what may be called the epoch of mound-building, but recently terminated, has been of very long duration. These estimates, divergent as they are, may serve to give some idea of our ignorance in regard to the actual antiquity of these ruins.

One thing is certain, no excavations of the mounds up to this date (1883) have yielded a single bone of those gigantic pachyderms, those extraordinary edentate creatures which frequently occur in earlier epochs. Must we not therefore conclude that these animals were extinct before the times of the Mound Builders? One of the mounds, however (fig. 36), as already stated, is claimed to represent a mastodon, and some pipes from Iowa to represent elephants (fig. 72); and if these highly problematical assumptions are correct, one might presume that the Mound Builders knew, at least by tradition, of the animals they imitated; but this point, like so many others, is still very obscure, and not free from complications due to fraudulent recently manufactured "relics."

We must await in the future what the present cannot give us; and meanwhile be on our guard against brilliant hypotheses, startling guesses, and over-rash conclusions.

¹ *Répertoire chronologique de l'hist. des Mound Builders*, "Cong. des Améric.", Luxembourg, 1877, vol. I., p. 312.

² *A quelle race appartenait des Mound Builders*.

³ "Cong. des Américanistes," Luxembourg, vol. I., p. 50.

CHAPTER V.

THE CLIFF DWELLERS AND THE INHABITANTS OF THE PUEBLOS.

THE nineteenth century, now approaching its decline, has played a grand rôle in the history of humanity, and never have such great things been accomplished with such marvellous rapidity. We justly count amongst those who have had a glorious share in the common work, the bold travellers who have opened, or are opening, up whole continents to civilization and progress. In America, as in Africa and Asia, the pioneers of science daily announce new discoveries. The vast regions of California, Arizona, New Mexico, Nevada, Colorado, and Utah, were, a few years ago, absolutely unknown. They are now intersected with railways; commerce and industry will shortly possess the land; populous towns have sprung up, and new states contribute to the development of the United States, and the greatness of this people, youngest born of the nations, which is undoubtedly predestined to play an important part in the future history of the world.

While awaiting the brilliant future of the states recently or to be admitted to the Union, we have to cross much half desert, rude, and desolate region where the trees, chiefly pines, are rare and stunted, the vegetation is feeble and meagre, and nature would at first sight appear to be doomed to eternal solitude. The very wild animals have almost deserted these dreary wastes which are only haunted by wandering Indians, perhaps the wildest and most barbarous of all the existing aborigines of North America, who not long since would flee at the approach of the traveller unless they felt themselves strong enough to rob him. We must cross the San Juan river to reach the alluvial districts des-

ained doubtless to yield a harvest so rich that it is impossible to overestimate its importance.

Things were different here in the past. These cañons, as



FIG. 86.—A Cañon of the Colorado.

are called the narrow gorges shut in between perpendicular rocks (fig. 86) with their deep ravines, these arid valleys

covered with brushwood rarely more than a few feet high, this dreary lifeless nature, presents a most striking contrast with the ruins that rise up at every turn, bearing witness that for centuries, which it is impossible to estimate, these countries were inhabited by a numerous, active, and intelligent population. In many man has built houses, fortifications, reservoirs, forming true cities; the very rocks are adorned with painted or sculptured figures; everywhere man has left behind him indelible marks of his presence.

The Spanish, who were the first to cross Central America,¹ gave the name of *pueblo*, which signifies a market-town or village, to groups of buildings, a great number of which, presenting every appearance of great antiquity, were already in ruins at the time of their victorious march. These buildings are found in the valleys drained by the San Juan, Rio Grande del Norte, Colorado Chiquito, and their tributaries for an area of two hundred thousand square miles.² The earliest inhabitants whose traces can be recognized evidently followed these valleys in their forward march, halting here and there where the soil was fertile, to be driven away by newcomers, who, like themselves, were seeking water and pasturage. The struggle for existence is a universal law written in every country in letters of blood.

Cabeça de Vaca speaks of some pueblos in ruins and others still inhabited³; many he says were larger than the town of Mexico. The houses, often consisting of several stories, one behind the other as in our illustration (fig. 87), were of stone. The inhabitants lived in the upper stories,⁴ and the ground floor, generally dark, served as a storeroom for food and fodder. These basements are known amongst the Spanish as *Casas de comodidad* or *Almacenas* (see Castañeda de Nagera, *Relacion de voy. de Cibola*). The upper stories were

¹ New Mexico was finally subdued in 1597 and 1598 by Don Juan de Oñate. The first Spanish expedition took place in 1540, under Cabeça de Vaca, shipwrecked on the shores of the Gulf of Mexico in 1535.

² Barber, "Cong. des Américanistes," Luxembourg, 1877, vol. I., p. 25.

³ "Quarta Relacion * * * Coleccion de Documentos," vol. II., p. 475.

⁴ Putnam, "Bull. of the Essex Institute," Dec., 1880.

reached by means of ladders, and when these ladders were drawn up the occupiers enjoyed comparative security, and could defend themselves from attacks which must have been frequent enough judging from the countless quartz, obsidian, and agate arrow-points found everywhere about these dwellings.

The buildings were nearly all of considerable size, and we shall describe some large enough to lodge several hundred families. Some, as the Taos pueblo (fig 87), were situated in the valley and were occasionally surrounded by a wall completing the defences; others, as the Pueblo of Acoma for instance,¹ which is supposed to have occupied the site of the present village of Acuco, rises from several plateaux or ter-



FIG. 87.—Pueblo of Taos, New Mexico.

aces called *mesas*, often situated several hundred feet above the valley, and only to be reached by all but impracticable paths. We can imagine the astonishment of the explorers when they saw all these ruins rising before them. "Imagine," says a recent traveller, "the dry bed of a river shut in between steep inaccessible rocks of red sand-stone, and a man standing in that bed looking up at the habitations of his fellow-creatures perched on every ledge. Such is the scene spread out before us at every step." Another traveller speaks of the evident proofs of a considerable population

¹ Y hallamos a un pueblo que se llama Acoma, donde nos parecio habria mas de seis mil animas. Antonio de Espeja, "Carta," 23d April, 1584. Doc. ineditos del archivo de Indias, vol. XV., p. 179.

having lived in these deserts, adding that there was not one of the six miles he had to explore that did not afford certain proof of having been inhabited for a considerable length of time by men absolutely distinct from and certainly superior to the wandering savages who alone traverse them now.¹

Lastly, to quote another of the many accounts, Major Powell, United States geologist, expresses his surprise at seeing nothing for whole days but perpendicular cliffs everywhere riddled with human habitations, which resemble the cells of a honeycomb more than anything else.

In these districts, now nearly uninhabited, dwelt numerous people to whom has been given the name of Cliff Dwellers, from the rocks in which they made their homes.

One point we can pronounce upon with certainty: we know beyond a doubt one of the chief causes of the depopulation of the country to be the diminished rainfall. The rainfall is very unequal in the United States. Its average is about three feet on the Atlantic coast from Maine to Florida. On the slopes of the Pacific, north of San Francisco, the west winds bring very abundant rains, the average reaching some four feet. From the coasts of the Atlantic, and from the delta of the Mississippi, the quantity of rain gradually diminishes as the interior of the country is approached. In some parts of Texas, Kansas, and Nebraska, the average rainfall of the year diminishes to a foot and a half, and in parts of Colorado it is even considerably less. The very small rainfall watering all the districts between the plains of the far West and the Pacific coasts explains the poverty of the vegetation.

The rivers, the very streams, are dried up, and we only find in the valleys the traces, already ancient, of dried-up water courses.

The rains of spring are of short duration, but plentiful. They pour down upon an impermeable soil with a rock foundation, forming impetuous torrents known as washes. At certain times and places these washes rise to a height of

¹ Holmes: "Report on the Ancient Ruins of S. W. Colorado, examined during the summers of 1875 and 1876."

thirty to forty feet, carrying everything before them and often causing inundations. After these torrents the water does not long remain in the arroyos, but evaporates with great rapidity. At other seasons rain is unknown, and the intense heat of the climate adds to the effect of this constant aridity. Can it be attributed to geological or climatic changes? Possibly it may, and Colonel Hoffman mentions an arroyo forty feet above the present level of the water about fifteen miles from the town of Prescott, Arizona. This is a curious fact, but it should be corroborated by many others before so important a decision can be arrived at, and it is possible that, as in Algeria, one cause of the persistent aridity was the reckless destruction of forests by the Cliff Dwellers.

Holmes, one of the first to study the ruins of the Far West, on a truly scientific method, adopts the following classification, which it will be useful to quote.¹

I. *Lowland villages*, in which dwelt the purely agricultural classes, the sites chosen being always in the most fertile valley and close to rivers.

II. *Cave-Dwellings*, caves artificially enlarged, often closed and strengthened with adobes or bricks of kneaded clay dried in the sun, such as are still used by the Indians for building their huts.

III. *Cliff-Houses*, true fortresses to which the people of the valleys probably retired when danger threatened.

The habitations in the valleys are regular pueblos; they form parallelograms or circles marked out, where the nature of the ground permitted, with great regularity. All are built of stone carefully laid, and the crevices generally filled with clay and mud. The circular ruins met with are sometimes those of towers used as defences or buildings sixty feet or more in diameter, enclosing several series of little apartments with one in the centre often half under ground, to which the Spaniards have given the name of *estufas*, meaning literally *stove* or *sweating-room*, in reference to their use as hot air bath-rooms or sweat-houses.

¹ L. c. p. 5. See also Jackson: "Ruins of S. W. Colorado in 1875 and 1877."

The estufas have been much discussed. Some think they were council-chambers where the chiefs of the tribe met to discuss public affairs; others look upon them as spots consecrated for the presence of the sacred fire, so long the object of veneration to the Indians.¹ Others think the estufas were wells, but the testimony of Ruiz settles the question. Mariano Ruiz lived for a long time amongst the Pecos Indians as a son of the tribe (*Hijo del Pueblo*), and he relates that these Indians preserved the sacred fire in an estufa until 1840, when the five families who alone survived became affiliated with another tribe. The fire was kept in a kind of oven and was never allowed to emit flames. Ruiz himself was in his turn charged to keep it up but he refused, influenced by the superstitious fear of the Indians, that he would should leave his brethren after having watched over the sacred fire would inevitably perish within the year. On account of his refusal he was never allowed to enter estufas. It is certain that these estufas occur in all habitations, even in those situated above precipices, or on rocks not to be scaled without extreme difficulty, so that it is evident that great importance was attached to them by the inhabitants of the pueblos. In New Mexico and Colorado estufas are sometimes met with, even in Christian villages, where they are looked upon with superstitious terror, perhaps as a last relic of the mysterious rites practised by the ancestors of the inhabitants.²

Besides the towers rising from the midst of the pueblos there are others generally round, rarely square or oblong (fig. 88), set up on points commanding a wide view, or at the entrances of cañons. It is evident that these were posts

¹ "These estufas, which are used as places of council and for the performance of their religious rites, are still found at all the present occupied pueblos in New Mexico. There are six at Taos; three at each house, and they are partly sunk in the ground by an excavation. They are entered by a trap door way in the roof, the descent being by a ladder." Morgan: "Peabody Museum Report," vol. II., p. 547. Am. Assco., St. Louis, 1877.

² Bandeller, "Report on the Ruins of the Pueblo of Pecos."—"Cong. Améric," Luxembourg, 1877, vol. II., p. 230.

³ Simpson, "Expedition to the Navajo Country," p. 78.

observation, where sentinels might be always on the watch to warn the inhabitants of any impending danger. The site of these posts was always admirably chosen; one of them overlooks the whole of the MacElmo valley, commanding a view for several miles up and down; another is situated at the spot where the Hovenweep divides into two branches. These towers have neither doors nor windows, and could doubtless only be entered from the roof.

Near some of these dwellings long lines of walls have been made out varying from twelve to eighteen feet in height and built of adobes or simply of earth. These were probably corrals or enclosures for cattle. Evidently these people were more civilized than the Mound Builders.

The cliffs themselves consist of sedimentary rocks, layers of hard sandstone very impervious to the action of the elements alternating with beds of very friable rock containing fossil shells. The last-named beds have been in part disintegrated by atmospheric action, and are riddled with holes and caves of every size, floored and roofed by the sandstone. In other places erosion has acted all along the outcrop of the bed so as to produce galleries, often of great length, though seldom very deep. Here and there a lofty promontory has been detached from the main cliff and has become even more difficult of access than the rest.

The early inhabitants of the region under notice were wonderfully skilful in turning the result of the natural weathering of the rocks to account. To construct a "cave dwelling" the entrance to the cave or the front of the open gallery was walled up with adobes, leaving only a small opening serving for both door and window.

The "cliff houses" take the form and dimensions of the platform or ledge from which they rise. The masonry is well laid, and it is wonderful with what skill the walls are joined to the cliff and with what care the aspect of the neighboring rocks has been imitated in the external architecture. Some explorers consider these houses to be more recent than the pueblos or the caves; the few arrow-points,

stone implements, and fragments of pottery which have been picked up do not justify an expression of opinion.

Several burial-places of the Cliff Dwellers have been found, but the difficulty attending their excavation, and the dangers to which the members of the United States survey who undertook it were exposed, have prevented any repetition of their examination. Nothing has been found but a few human bones, with weapons, implements, and pottery always placed near them. Like the Mound Builders and all the ancient races of America, the Cliff Dwellers were actuated by a hope of a future life for their departed ones, as it proved by this provision for their supposed needs.

We must also mention enclosures of considerable extent containing upright stones like the cromlechs of Europe, arranged in circles. Excavations have been made in one of these enclosures on the left bank of the Dolores; the original soil, which had not been displaced, was quickly reached, and rested on the surface of the rock itself. At a depth of six inches was found a layer of cinders mixed with fragments of pottery, but no bones justifying us in supposing the enclosures to have been burial-places, nor has the chemical analysis of the cinders yielded any trace of animal matter, so that the idea of cremation is excluded.¹

Having enumerated, in a general way, the various structures attributed to the Cliff Dwellers, a few details respecting each will render their importance clearer.

The Rio Mancos² flows between cliffs, formed of alternate beds of cretaceous limestone and a clayey deposit, in many parts disintegrated and worn away by the action of water. One of the indentations thus formed, situated about forty feet above the level of the river, is between four and

¹ Jackson, *l. c.*, pp. 415, 421, etc.

² The Mancos rises in the La Plata mountains, on the southwest of the Colorado, and flows into the San Juan. The other tributaries of the San Juan, to which we shall have occasion to refer, are the La Piedra, Los Pinos, Las Animas, La Plata, the MacElmo, Hovenweep, and the Montezuma. The two last are almost always dried up. On the south, the San Juan receives the Navajo, Chaco, and Chelly.



FIG. 88.—Tower near Epsom Creek.



FIG. 89.—Cliff-house on the Rio Mancos.

six feet deep.¹ In this narrow space the Cliff Dweller had set up their homes. Seven of these homes remain, four in a sufficiently good state of preservation for the mode of their construction to be made out. The walls are of stones, cemented with clay mixed with cinders and charcoal.² The mortar was strengthened by the insertion, in the interstices, of pebbles or little bits of pottery, and to this day one can make out in this mass the marks of the tools used and even the fingers of the workmen. All the openings are very narrow, and the doors and windows are but a few inches in width and height. In the midst of the ruins a cellar was discovered, choked up with a mass of rubbish, once a store of food from which half-calcined grains of maize have been taken, of a species still cultivated in the country. A hatchet of polished stone and a few fragments of

¹ Holmes: *Loc. cit.*, p. 39 XXXV.

² Castañeda ("Voy. de Cibola," ch. iv., p. 168), says: "They use no lime, and they replace it by a mixture of cinders, charcoal, and clay."

tery were the only other objects found in the excavations, which had to be rapidly executed.

Another group (fig. 89), a short distance from the first, rises from the indentations of the rock, which towers above the river to a height of about two hundred feet. The lower structures occupy a free space, sixty feet long by about fifteen feet at its widest part (fig. 90). The walls are about one foot thick, and are flush with the very edge of the precipice. They are erected with skill, the angles are regular, the lines do not diverge from the perpendicular, and, when the difficulties the builder had to contend with in laying his foundations in such a position and at such a height are taken

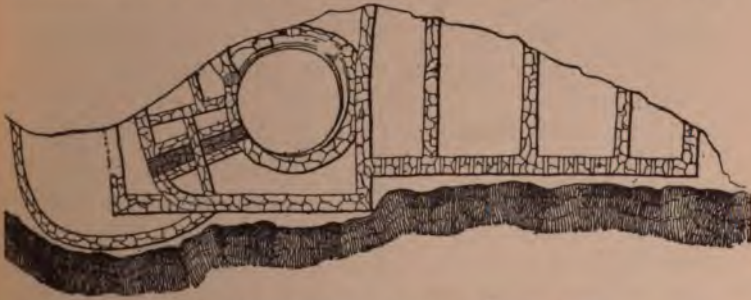


FIG. 90.—Cliff-house on the Rio Mancos (ground plan).

into account, these aerial dwellings may well excite our admiration. In the centre we find the inevitable estufa, and, as far as we can now tell, it could only be entered by an opening of twenty-two inches; and, moreover, in order to reach this strange door, a regular tunnel, thirty feet long, had to be crawled through. The various rooms were separated by division walls, which did not reach to the rock above, so that communication between them was easy by means of movable ladders.

Some hastily conducted excavations yielded two vases of coarse pottery, closed with stone covers of equally rude workmanship. These vases, which would hold three gallons, were empty: one of them had been mended with a fragment of the same color, stuck upon it with viscous clay; they

were placed on a bed of bark fibres covered with a mat of woven reeds,¹ another proof of the value placed upon them by their owner.

Between the two houses the rock is absolutely vertical; at a place where the slope is a little less abrupt some steps roughly indicated rather than cut in the rocks have been made out. At present they offer very little assistance in climbing the cliff. It is probable, however, that these indentations, never very deep, have suffered by weathering.

At the level of the upper story another ledge has permitted the erection of another structure. This second platform is about one hundred and twenty feet long by ten at its greatest width. The work appears never to have been completed. The Cliff Dwellers were probably discouraged by the difficulties in the way of bringing their materials to the spot.

The finished parts had been inhabited, and the rooms communicated with each other by means of low and narrow doors. In one of these rooms the explorers thought they recognized traces of a fire, in others the excavations yielded some grains of maize and some kidney beans; but unfortunately the explorers, exhausted with a long march, could not or did not search further.

In some instances the houses of the Cliff Dwellers were at a very much greater height. Some are mentioned, by Holmes, as eight hundred feet above the level of the river, so well concealed that even with the aid of a telescope they can hardly be distinguished from the rocks protecting them. We lose ourselves in conjectures on the means employed to reach the places from which the buildings rise, or to take to them provisions and other necessities of life. Ives, in his report on the Colorado River of the West, tells us that to-day the Moquis often build at very great elevations, carrying the stones and earth needed in packs on their shoulders. For a long time it was supposed that all the Cliff men had to go down to the river to draw water; but fresh researches

¹ Holmes: *Loc. cit.*, pl. XLV.

have led to the discovery in certain localities in the cliffs themselves of springs, the waters of which supplied their needs and were stored up in natural or artificially enlarged reservoirs.



FIG. 91.—Two-storied house on the Rio Mancos.

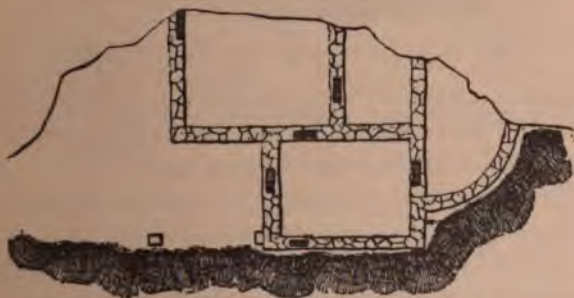


FIG. 92.—Cliff-house on the Mancos (ground plan).

A mile farther on, still following the banks of the Rio Mancos, Jackson discovered a structure seven hundred feet above the level of the river (figs 91 and 92). This building, to which he gave the name of the Two-story Cliff House,

is better preserved than any of those surrounding it. One of the rooms measures nine feet by ten, another is six feet square, while the height of the building is twelve feet, and there is a space of between two and three feet between the walls and the rock which overhangs them like a roof. These rooms, which appear to us so small, were large for the Cliff Dwellers, and Jackson speaks of another place where a space of fourteen feet long by six wide and five high was divided into two rooms of nearly equal size, the entrance was gained through a little square hole. Examples might easily be multiplied; at Montezuma, for instance, there are cells of which the largest are not more



FIG. 93.—Interior of a room in a cliff-house.

than nine and a half feet square, whilst the smaller ones are not quite four feet square. It seems astonishing that human creatures could exist in such cramped spaces!

The inside walls of these rooms (fig. 93) were covered with several coatings of clay moistened with water. This mortar was laid on with the hand; the marks of the fingers of the workmen leave no doubt on that point. The smallness of these fingers has even led some to suppose that the work was done by women.

The same care was bestowed on the outside coating, and the mortar is gray or pinkish in color, exactly imitating that of the neighboring rocks. It is impossible to say

whether this is the result of the action of time, or if the workmen selected the clay with a view of better concealing their homes.

Were these cliff-houses only places of refuge, to which the inhabitants of the valley retired on the approach of danger? Holmes says that we are tempted to suppose they were, when we note the all but total absence of the bones of men or animals, or of the refuse of all kinds so plentiful in the kitchen middens, and which are proofs of long residence.

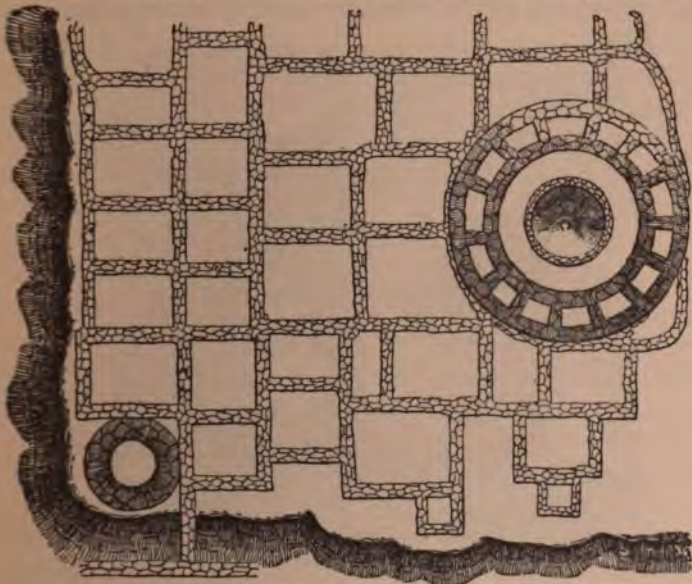


FIG. 94.—Pueblo of the MacElmo valley (ground plan).

The coatings of clay have remained as fresh and compact as when they were first laid on; a fact especially noticeable in the Two-story Cliff-House; and if it had been long inhabited it must have undergone a thorough repair just before it was deserted. Other explorers, it is true, speak of charcoal and traces of fire as proving a lengthy sojourn of man; but archeologists too generally come to the study of such remains with preconceived notions, which notions are too often reflected in the impressions of travellers.

The MacElmo valley contains ruins no less important than those just mentioned. We reproduce (fig. 94) a plan of one of them, which is useful as giving an idea of the general arrangement of a pueblo. The large tower or estufa presents a certain resemblance to the singular structures of the Balearic Isles to which the name of *Talayoti* has been given. It is built of unhewn stone, and is surrounded by a triple wall. The space between the two external walls is only five feet, and it contains fourteen cells. Another estufa, with walls more than three feet thick, is situated



FIG. 95.—Tower on the summit of a rock in the MacElmo valley.

one of the extremities. The rooms, or rather the cells, are rectangular and all extremely small.

This pueblo is in the heart of a rather barren district, and is about a mile from the MacElmo river, which always dries up in summer. The unfortunate inhabitants must therefore have been reduced for several months in the year to fetch their water from the Dolores, at a distance of fifteen miles, if we suppose the conditions to have remained unchanged. This is, however, quite an inadmissible idea, for no agric-

tural population could have lived under such conditions. "To suppose an agricultural people existing in such a locality, with the present climate, is manifestly absurd," says Holmes (p. 399); "yet every isolated rock and every bit of mesa within a circle of miles is strewn with remnants of human dwellings (fig. 95). We must therefore admit, as we have already stated, considerable climatic changes since the time when the country was peopled."

The same remark applies with even greater force to the ruins of Aztec Spring in Colorado, so called after a spring (E, fig. 96) that Captain Moss speaks of having found, but which has disappeared since his journey. These ruins (fig. 96), situated on the Mesa Verde, at an equal distance from the MacElmo and the Mancos, cover an area of 480,000 square feet, and represent an average of 1,500,000 cubic feet of masonry.

The principal building forms a rectangle (A), eighty feet by one hundred, surrounded by a double wall and divided into three separate rooms. The walls are twenty-six inches thick and vary from twelve to fifteen feet in height; between the two walls are twenty cells whose purpose it is difficult to guess, but which may have been store-rooms.

Three estufas (B, C, and D) rise in the centre of the enclosure, and as far as can be judged in their present condition, they may well have served as cisterns for keeping the water needed by the inhabitants.

The division walls are of adobe brick, the outer walls of blocks of fossiliferous limestone from the Mesa Verde, all symmetrically hewn and cemented with clay mixed with the dust of the decomposed carbonate of lime abundant in the neighborhood. It is doubtless thanks to this mortar that the ruins of Aztec Spring are so well preserved.

The Hovenweep, now entirely dry (the name is borrowed from the Ute language and signifies *desert cañon*), once flowed between abrupt and desolate cliffs. Everywhere in the valley we meet with series of ruins, including at every turn those strange dwellings of several stories perched—

that is just the expression for it—on all the ledges or terraces of the cliffs. Here we note the exceptional circumstance that the houses are circular, their diameter not ex-

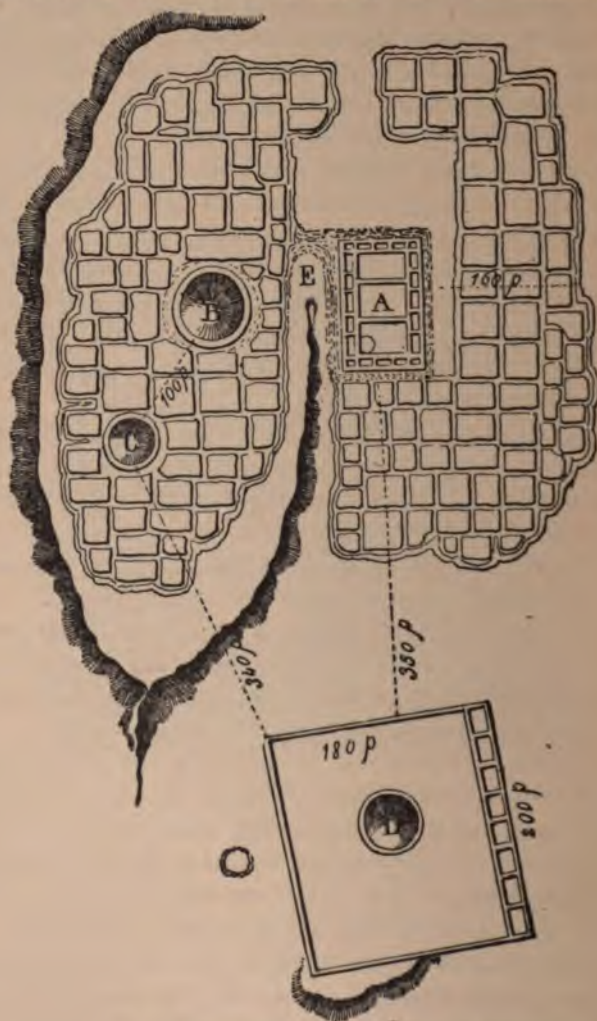


FIG. 96.—Aztec Spring (ground plan).

ceeding twelve to fifteen feet, the angles are rounded, and the walls built of stones, each as large as three ordinary bricks.

Every thing seems to have been done with a view to defence; the houses were all but inaccessible, and little watch-towers had been erected at every point commanding an extended view. On a natural terrace measuring scarcely three hundred feet by fifty, situated at the very source of the Hovenweep, the Cliff Dwellers had managed to erect no less than forty different houses.

Montezuma valley¹ is at certain points ten miles wide. It is covered with ruins: towers with a triple enclosure, mounds made up in a great measure of pieces of broken pottery. The cliffs overlooking the valley present a long series of caves, ledges, and rock-shelters, invariably turned to account by man (fig. 97). In many places holes have been observed, cut in the rock at regular distances, in which the feet and hands could be successively placed. These were the only means of access; no tree native to these valleys could have supplied ladders long enough to reach these eagles' nests. In one of these rock-shelters the explorer discovered the skeleton of a man, wrapped in a covering with broad black and white stripes. This man had, however, no connection with the ancient inhabitants of these aerial dwellings. According to all appearances he was a Navajo, a victim to the incessant warfare between his tribe and the Utes.

We must also mention seven erect stones in the Montezuma valley, which rise in the midst of its desert like the menhirs of Brittany or Wales. Later observations, however, lead to a belief that these were not menhirs, but pillars intended to strengthen defensive works. Defence, in fact, seems to have ever occupied the thoughts of these men; for in a radius of fifteen miles, at every point commanding the valley or that could serve as a post of observation, we find blocks torn from the neighboring rocks and piled up one on the other, the interstices being filled with small stones to consolidate the mass. Every thing bears witness to the presence of a numerous population; such works can indeed only have been constructed by numbers.

¹ Jackson, *l. c.*, p. 427 *et. seq.*

The rocks of the Rio de Chelly enclose habitations exactly similar to those we have just described. In fact we are doomed to inevitable repetition in describing the remains of the Cliff Dwellers, of whom these buildings, a few fragments of pottery, and wretched flint implements are the only



FIG. 97—House in a rock of Montezuma cañon.

relics. On the Rio de Chelly, as in the Montezuma valley and on the banks of the Mancos or the MacElmo, natural and artificial caves, depressions, and the smallest ledges have been turned to account. The buildings are often of excep-

importance, and Jackson, (*l. c.*, p. 421) speaks of some an elevation of seventy feet which he calls a Cave. They are 545 feet long by a maximum width of forty feet. Nearly all include a ground-floor and one story; one of them has two stories, and is supposed to have been the residence of the chief. The walls are everywhere very thin, some exceeding one foot in thickness, while some are only half as much. The stones are imbedded in a thick mortar and coated with it inside and out. Seventy-five separate rooms have been made out, with the inevitable estufa or kitchen, and behind the house are two little reservoirs for storing water. None of these houses have any openings or windows which almost all face an inside court, and this situation has resulted in the discovery of no means of access. Broken pieces of rock and natural fissures which were used as a help in climbing; several corrals or interior pens are still full of dung reduced to dust; how did these people ever get cattle up to such a height, and how could they sustain them on steep rocks with no outlets? Any number of guesses may be made, but it must be admitted that the evidence is completely satisfactory. The height of the schistose sandstone which crown these structures is more than two hundred feet above the foot of the Mesa. Descent from this point is therefore even more difficult than ascent from the valley. The Mesa is arid, desolate, and covered with stunted vegetation.

At the foot of the rocks we see a number of upright stones surrounding rectangular spaces such as those of which we have already spoken. Here, too, excavations have produced nothing to suggest that these stones marked graves. Some red earthenware, knives, hatchets, and finely chipped stone arrow-points are all that have been found.

See a drawing (fig. 99) of a house built at a height of twenty feet about two miles from Cave Town. This helps us to realize the difficulties of access and the methods employed to surmount them. The house is one

story high; the ground-floor measures eighteen feet by ten, and this narrow space forms two separate rooms, whilst the first story consists of only one. The overhanging rock serves as a protecting roof. Eight miles from Cave Town is another group of similar buildings of smaller size.

The whole of Epsom Creek valley, so called after a stream of brackish water which is said to taste something like Epsom salts, is covered with ruins of a smaller size than those already noticed. These are chimney-like caves (fig. 98), which Jackson calls "cubby-holes," and are situated now on the banks of a stream, now wedged like sandwiches between the layers of rock. These dwellings generally contain but a single room, the walls of which are so perfectly



FIG. 98.—Cave-Town near the San Juan.

coated that even now there is not a crack in the mortar. The entrance to the valley was defended by a tower (fig. 88) on an inaccessible elevation, which Mr. Jackson made many fruitless efforts to scale; on the opposite bank of the stream rises another circular tower forty feet in diameter, of which the antiquity is attested by its crumbling walls covered with moss and brushwood.

A few miles up stream, on the banks of a deep ravine, are ruins presenting the aspect of a fortified town. Explorers found themselves face to face with a great mass of rectangular form, with towers connected with each other and arranged on either side of the ravine, so as to command all



FIG. 99.—Cliff-house in the Cañon de Chelly.

the operations. The constant wars amongst these people caused a constant state of the attacks of enemies, hence the necessity of being always prepared to repulse them. "The best [ancient] wall," said the *San Francisco Evening Examiner* of July 3, 1861, "known with rare for hundreds of miles, round buildings, there some high of masonry, are still standing."

The walling is on the banks of the La Plata, twenty-five miles from its mouth, with the San Juan, and five miles south of the Sonora, Pacific Railroad, should also be men-



FIG. 100.—Casa Grande in the Gila valley.

tioned, it only on account of their peculiar arrangement. They stretch away irregularly throughout the valley; each family had its own home. Every thing bears witness to a state of culture different from those hitherto noticed. The family seems to have come into existence, and isolated dwellings, such as we meet with in all countries of Europe, show still better the independence of their inhabitants. "These houses," says Holmes (*l. c.*, p. 388), "seem to be distributed very much as dwelling-houses are in the rural districts of civilized and peaceable communities."

Cliff houses are as numerous in Arizona as in New Mexico, but their sites seem to have been better chosen, and the foundations are of stone, though there is nothing to lead us to suppose them to be older than the walls of adobes rising from them. We have now reached the extreme southern limit of the districts occupied by the Cliff Dwellers, and the vast heaps of broken earthenware met with at every turn bear witness to the great length of their residence.

Amongst all these ruins, the *Casa Grande* (fig. 100) merits special mention. It rises from a little eminence in the valley of the Rio Gila, two miles and a half from the river, and it appears certain that it had existed for several centuries before the arrival of the Spaniards, who knew of it from the time of their very earliest expeditions; indeed, it is generally admitted that it is to it that Coronado refers under the name of the *chichilticalle* or the red house. The first at all complete description, however, which has come down to us, is that of Father Mange, who visited the *Casa Grande* with Father Kino, in 1697.¹ It appears that at that date the ruins included eleven different buildings, surmounted by a protective wall of moderate height. Now these buildings are reduced to three, only one of which is still in a state permitting of its examination. It is built of large adobes measuring four feet by two, and it is fifty feet by forty feet in size. The walls are five feet thick at the base, and gradually decrease in breadth toward the top.² The inside is divided in five rooms (fig. 101), much larger than any hitherto described. The central of these rooms are eight feet long by fourteen wide; the others are as much as thirty-two feet long by ten wide.³ Fragments of cedar-wood beams, still inserted in the walls, prove that the buildings originally consisted of three, perhaps in its central portion of four, stories.

¹ "Doc. Hist. Mex.," Series IV., vol. I., p. 282. Bancroft: *loc. cit.*, vol. IV., p. 621, *et seq.*

² Bartlett: "Personal Narrative of Explorations and Incidents in Texas, New Mexico, California, Sonora, and Chihuahua." New York, 1854, vol. II., p. 271, *et seq.*

³ Judging by the plan, these measurements appear to be mere rough approximations.

No staircase, nor any thing to take its place, can be made out, so that communication between the stories must have taken place by means of ladders. A vast conflagration has everywhere left indelible traces, and this is supposed to have been the work of the Apaches, the wildest and most indomitable of all the Indian tribes.

The Casa Grande was the centre of an important establishment. Bartlett tells us that in every direction as far as the eye can reach we see crumbling walls and masses of rubbish, the remains of old buildings; while Fathers Mange, Kino, and Font say that the plain was covered for a radius of ten miles with hillocks of adobes turned to dust. In fact volumes would not suffice to describe all the ruins in these



FIG. 101.—Ground plan of the Casa Grande.

regions or all the people who have inhabited them. We can only name those of the valley of the Rio Salado and its tributary the Rio Verde, the former of which flows into the Gila.¹

Several acequias, or canals for irrigation also bear witness to the industry of the inhabitants.² Father Mange speaks of one near the Casa Grande, intended to receive the waters of the Gila. This canal was twenty-seven feet wide by ten deep and was three leagues long. These figures, we must add, appear exaggerated to later travellers, though they mention another canal in the Salado valley which must have been nearly as wide, and was four or five feet deep. The Cliff Dwellers then did not shrink from such undertakings, any more than did the Mound Builders, when they were

¹ Bancroft, vol. IV., pp. 632 and 635.

² Whipple, Ewbank, and Turner: "Report upon the Indian Tribes."

helpful to their commerce or their agriculture. They illustrate perhaps better than their buildings to what a degree of culture these people had attained.

We must now compare with the Casa Grande of the Rio Gila some other yet more extensive ruins, resembling them in every respect, situated in Chihuahua. These buildings, to which the Spaniards have given the same name of *Casas Grandes*, deserve mention here, as they are evidently the work of the same race and date from the same epoch as those of Arizona.

These Casas Grandes are situated in the San Miguel valley, not far from the present boundary between the United States and Mexico. The country is occupied by the Apaches, who make all exploration dangerous.¹

Masses of rubbish in the midst of which rise parts of walls some of them fifty feet high, indicate the old site of the town. The walls were built of adobes. These adobes were of very irregular length and twenty-two inches thick, while the walls themselves were nearly five feet wide and simply coated with clay moistened with water. The chief building was 800 feet long on the fronts facing north and south, but only 250 on those to the east and west. The "*Album Mexicano*" says 1380 feet by 414, and Bartlett, from whom we quote our figures, probably did not include detached buildings in the sum total. In 1851 when Bartlett visited them there were neither stones nor beams to be seen, and the state of dilapidation was such that neither the marks of a floor nor of a staircase could be made out; nor could he tell the number or height of the stories. Other less conscientious explorers assert that the principal buildings were three stories high and surmounted by a terrace.

He had the same difficulties to contend with in examining the internal arrangements; but in one place he made out

¹ Arleguy: "*Chron. de la Prov. de S. Francisco de Zacatecas*," Mexico, 1737, p. 104. Clavigero: "*St. Ant. del Messico*," vol. I., p. 159. Escudero: "*Noticias del Estado de Chihuahua*," p. 234. "*Album Mexicano*," Mexico, 1849, vol. I., p. 374. Bartlett, "*Personal Narrative*," New York, 1834, vol. II., p. 347.

six chambers twenty feet by six in extent, and this restricted space, was still further curtailed by a little niche three to four feet high at the end of each chamber, the use of which is unknown.

A short distance off, other buildings surround a square court. Here too we find the little cells which are one of the characteristic features of the Casas Grandes as of the cliff-houses and the pueblos. This is an important indication of similar habits, and of the similar origin of the builders.

There are more than 2000 mounds in the neighborhood of the Casas Grandes, and it is probable that they were burial-places. Excavations have not, however, produced a single human bone. All that has been picked up are a few stone axes, clumsy earthenware statuettes and fragments of pottery, decorated with red, black, or brown ornaments on a generally white ground.

A few miles farther off rises a regular fortress, not built of adobes, but of well-dressed stones put together without mortar of any kind. The walls are from ten to twenty feet thick, and the summit is reached by a path cut in the rock. There is nothing to show whether this fortress was erected to defend the Casas Grandes, or even if it existed when that little town flourished.

Important ruins are to be seen on either side of the Colorado Chiquito, one of the upper branches of the Colorado. They date from different epochs, and on foundations of unwrought stone we find, as in Arizona, walls made of adobes or of wood. Numerous fragments of fine light pottery, seldom painted, bits of obsidian and of rocks mostly foreign to the locality, also witness to the presence of man.¹

Among the ruins is one building measuring 120 feet by 360, situated on an isolated eminence. The walls have all but crumbled away, but we can still see that they were

¹ Sitgreaves, "Report of an Expedition down the Zuñi and Colorado Rivers," p. 8, Washington, 1853. Whipple, "Report and Explorations near the 35th Parallel." B. Mölhausen, "Tagebuch einer reise vom Mississippi nach dem kusten der Sud See," Leipzig, 1858.

twelve feet thick. Inside we find the same little cells we have so often described. We must also mention a fort, if we may so call it, which rises from the western bank of Beaver Creek.¹

The river flows between deep cañons, presenting a desolate aspect. Toward the middle of a cliff with perpendicular walls and no means of access, at a height of a hundred feet, rises a square tower of admirably dressed stone, which may have been from thirty to thirty-five feet high. Each story rising behind the one below contains but a single room, the dimensions of which vary from four to eight feet square by a height of three to five feet. The floors are of beams roughly squared, and the openings are few and very narrow. It is extremely difficult to penetrate this tower. Throughout the valley, as far as Montezuma Wells, rise similar towers, which have been justly compared by a traveller to swallows' nests. It must have required unheard of labor to transport and work the stones under such conditions. We ask ourselves what manner of men were the builders and what can have been their aim; but we are unable to answer these constantly repeated questions.

But we have not yet exhausted the surprises which await us in these regions; that is, if we can accept with full confidence the account of Captain Walker, who speaks of having discovered in 1850, on the banks of the Colorado Chiquito, a regular citadel, situated in the centre of a town, the ruins of which extend for more than a mile, and of which the streets running at right angles with each other are still recognizable.² "A storm of fire," he says, "had passed over the town; the stones are calcined by the flames; the very rock from which the chief building rises bears traces of fusion; every thing testifies to the intensity of the heat."

Before entirely rejecting an account which no one has yet confirmed we must remember that more important traces

¹ Dr. Hoffman: "Ethn. Obs. on Indians Inhabiting Nevada, California, and Arizona," U. S. Geol. and Geog. Survey, 1876.

² *San Francisco Herald*, quoted by Bancroft, "Native Races," vol. IV., p. 647.

exist in Missouri, on the Gasconade River, not far from St. Louis, of an ancient town with regular squares, roads crossing each other at right angles, and houses of unwrought stone without any traces of mortar. We may also mention similar ruins at Buffalo Creek and on the Osage River.¹

Some time ago Major Powell ascended for some hundreds of miles the Great Colorado, still so little known. He tells of having noticed in dreary and deserted regions traces of a population now completely passed away. Everywhere in the valleys are pueblos, and cliff-houses are seen at every turn in the wild and picturesque cañons, among rocks about 4,800 feet high, and where the cliffs sometimes lean so closely together that one is tempted to believe that the river sinks into a subterranean passage like the tunnels of a railway. Round about these abandoned habitations the travellers found fragments of pottery, arrow-points, and chips of quartz, similar to those which have been picked up everywhere in Central America.

We have described numerous buildings situated in the valleys at the foot of the rocks on which the cliff-houses were built, all the approaches to which were defended by watch-towers or other posts of observation. Every thing tells of constant reprisals, of incessant peril, and formidable enemies. But there are yet other more considerable ruins, of more imposing appearance as a whole, the former inhabitants of which do not appear to have been exposed to the same dangers.

These formed peaceable communities, exclusively agricultural, in which communism under the authority of a despotic chief appears to have been the prevalent system. Gregg, who crossed New Mexico about 1840, was the first to describe them,² and he tells us that the ruins of the Pueblo Bonito in the Navajo country, at the foot of the mountains included houses built of slabs of sandstone, a mode of con-

¹ Conant: "Foot-prints of Vanished Races," p. 71.

² "Commerce des Prairies," vol. I., p. 284, New York, 1844. The pueblo of which Gregg speaks under the name of the Bonito Pueblo is probably the Pintado Pueblo.

struction quite unknown in the country at present. These houses are still intact, though their antiquity is such that we are absolutely ignorant of their origin.

In 1849, Colonel Washington, Governor of New Mexico, organized an expedition against the Navajos, who infested the northern part of the territory, and it is to Lieutenant, afterward General, Simpson, attached to the topographical

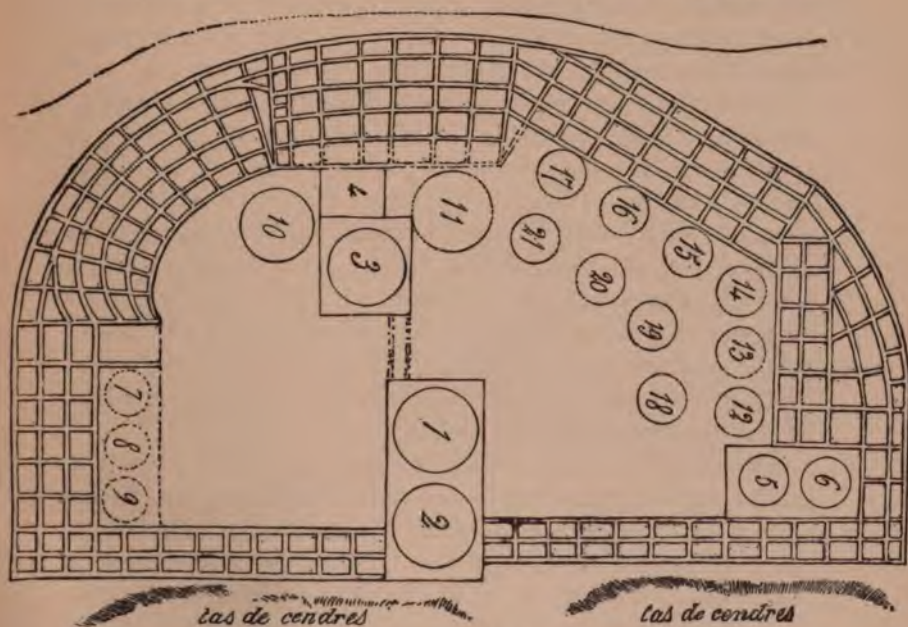


FIG. 102.—Ground plan of the Pueblo Bonito in the Chaco Cañon.

department of the army, that we owe the first regular plans of the ruins met with by the soldiers at every turn in crossing the Chaco Cañon.¹

The Bonito Pueblo is the most important of these villages (fig. 102). It will be well to describe it with some detail,² to be able to compare it with other pueblos closely resembling

¹ "Report, Secretary of War," Thirty-first Congress, First Session.

² Ruins of Chaco Cañon examined in 1877. Jackson, *l. c.*, 432, 440, *et seq.*, pl. LVIII.

it in their chief arrangements. We must add, however, that most of them are of rectangular plan, and that they present a unity of design that we do not find to the same extent in the Bonito Pueblo.

This pueblo, built doubtless by degrees as the necessities of the moment dictated, rises below the perpendicular rocks which limit the Chaco Cañon, and forms an irregular half of an ellipse measuring five hundred and forty-four feet by four hundred and fourteen. An inside court is divided into two almost equal portions by a row of four estufas.

Two wings are placed perpendicularly to the principal building. The left wing is divided into three rows of parallel rooms, measuring from twelve to twenty feet long by from twelve to fifteen wide, larger than those of the cliff-houses. The outer walls are in ruins, but the division walls in pretty good preservation still reach up to the second story. This wing forms a quarter of a circle, and although the whole of this portion has suffered very much we can still make out five rows of cells, with nine cells to each row. Lastly we must mention three estufas, half underground, a little in advance of the buildings.

In the right wing the walls are better preserved; they are still thirty feet high, and four different stories, one above the other, have been made out.¹ This part of the buildings appeared to the explorers to be the most recent portion of the whole pueblo, some of the beams which supported the floor are still in their places, and from them we can judge how the different rooms, the largest of the pueblo, were arranged.

The state of decay of part of the ruins is such that it is impossible to decide on the exact number of the rooms. In a neighboring pueblo, that of Pintado, one hundred and fifty have been counted, and every thing points to the conclusion that there were even more in the Pueblo Bonito.

¹ There are also several stories in the neighboring pueblos. The Pueblo Pintado has four; the second, ten feet high; the third, seven. The Pueblo of the Arroyo has three stories, and many others might be quoted.

Neither the inner nor the outer walls show any trace of stairs, so that it is probable the inhabitants went from one story to another by means of ladders—a mode of access still obtaining in the pueblos now inhabited. The windows are extremely small, and their lintels consist of pieces of cedar or pine wood scarcely squared and merely laid side by side. The floors must have been of wood, but most of them were used by Colonel Washington's soldiers to feed their camp-fires.

The walls of the eastern side are pretty well preserved, and rise to the height of the second story. On this side are the two largest estufas of the pueblo, their diameter exceed-



FIG. 103.—Different kinds of masonry used in the buildings of the Chaco Valley.

ing fifty feet. They were situated in the centre of a court, and covered by a mass of masonry, forming a rectangle of one hundred and fifteen feet by sixty-five. Farther on, masses of rubbish mark the site of buildings, the use of which cannot be made out, connecting the large estufas with two small ones, which touched the chief buildings. In the court itself, a series of excavations, filled with rubbish of all kinds, suggests a set of subterranean passages, and it is to be regretted that this interesting point has not been verified.

The masonry, generally remarkable for the care and precision with which it is executed, contrasts strangely with that now to be seen amongst the sedentary Indians. The

people of the pueblos always selected the largest stones to frame the openings, and they placed them exactly at right angles. In the very diverse buildings which make up the Pueblo Bonito, this masonry presents remarkable differences (fig. 103); it does not all seem to date from the same period, and it may be that parts have been restored at more recent epochs than that of the original buildings. In many parts the walls are strengthened with round pieces of wood, three to four inches in diameter, set upright; and, by others, ten to fifteen feet long by six to eight inches in diameter, arranged horizontally. We find a similar plan adopted in the islands of Greece,¹ subject, as they are, to disastrous earthquakes, and the same causes may have led the inhabitants of New Mexico to take the same precautions. Let us not weary of calling attention to the similitude in the intellect of man and the identity in his ideas all over the surface of the globe. For, truly, it is one of the most curious points of the study in which we are engaged.

We must also note the great number of *estufas* which everywhere rise amidst the ruins under notice. Jackson has counted twenty-one of them. They are generally remarkable for their size and the solidity of their construction. Nearly all of them were on a level with the soil, and their height was greater than that of the other buildings. There were no lateral openings to be seen, and it is probable that, as in the Pintado Pueblo, the entrance was from a hole in the roof. Most of these *estufas* are completely in ruins, and their site alone is marked by a pile of earth and stones. Those few still standing prove the intelligence of the architects and the skill of the workmen. In some pueblos the *estufas* are strengthened with buttresses; in the Hongo-Pavie Pueblo, for instance, the *estufa* is flanked by six buttresses, forming regular pillars; and, in the Pueblo Pintado, there are four very similar ones. Instances of this peculiarity might be multiplied.

Every discovery confirms the importance of these *estufas*.

¹ "Les premiers Hommes et les Temps pré-historiques," vol. I., p. 414.

We have noticed them in the cliff-houses, we find them again in the pueblos, and to this day they are to be seen amongst the Moqui Indians, where they consist of square rooms used as workshops for weaving. The Moquis, both male and female, assemble in them to avoid the great heat of the day, or, according to more credible accounts, to practise their mysterious rites. This constant presence of the *estufa* is another point of comparison which must not be forgotten.

In the course of his researches Jackson discovered outside the enclosure of the pueblos, on the east, some little structures raised on a bank of stones forming the lower stratum of the rock. The calcareous bed had indeed been lengthened by a layer of masonry, formed of large and small stones arranged alternately. Yet farther off was another more important mass of ruins covering an area of 163 feet by 73, and including two *estufas*. All appearances pointed to the conclusion that these ruins were connected with the Bonito Pueblo.

Time doubtless failed the explorers for the excavation of the two heaps of cinders on the south of the pueblo; but it is very certain that these middens would have yielded many objects which would have made us better acquainted with the ancient inhabitants of the pueblo.

Amongst the other pueblos discovered we must mention that of Una Vida, the *estufa* of which is the largest hitherto found, its diameter exceeding sixty feet; the Pintado Pueblo, already referred to more than once; the Weje-Gi Pueblo; the Peñasca-Blanca Pueblo, of elliptical form, with an internal court measuring 364 feet by 269, the largest of any after the Bonito Pueblo, the buildings covering altogether an area of 499 feet by 363; and the Arroyo Pueblo, in which three stories can be made out, with floors of interlaced willow branches covered with beaten earth. Near these large pueblos were several other very small ones. That marked 9 in the plans drawn by Jackson is only seventy-eight feet by sixty-three; yet it has two *estufas* and some twenty rooms. A detailed description of these pueblos would involve us in

constant repetition. Everywhere we meet with the same class of structures with their remarkable regularity, their walls of stones or adobes, and their estufas overlooking the rest of the buildings. We must add, however, that the Pueblo Alto, which can scarcely be seen from the valley, is situated, like the cliff-houses, at the top of a hill of considerable height. It is reached by a flight of twenty-eight steps roughly cut in the rock, and on either side holes can be made out, in which the hands could be placed to facilitate the ascent. Arrived at the Mesa we find ourselves opposite a building forming a parallelogram, presenting every appearance of great antiquity, and probably much older than any of the structures in the valley. Close by we see a huge heap of rubbish of all kinds, chiefly fragments of pottery. This heap has been measured by American engineers, who estimate its contents at 25,000 cubic feet. We can but repeat our regrets that the explorers could not undertake any excavations, which would doubtless have aided in the elucidation of the problems we have stated.

The traveller is well rewarded for the fatigue of the ascent of the Pueblo Alto. Beneath his feet he sees the ruins rising from every part of the Chaco Cañon, while beyond stretches a vast panorama; on the north the basin of the San Juan and the La Plata chain; on the east the Sierra Tunecha; on the south the snowy crest of the Sierra San Mateo; on the west the Jemez Mountains, overlooked by the Pelado with its eternal snows. All else is changed, nature alone has remained immovable, and the man of the 19th century enjoys the same view, alike imposing and attractive, which must have charmed the ancient inhabitants of the pueblo.

At the Chettro-Kettle Pueblo, General Simpson, during his first exploration, was able to examine a chamber still in a remarkable state of preservation.¹ We cannot do better than quote the description he gives, which proves that the

¹ "Journal of Lieutenant James A. Simpson in the Report of the Secretary of War"; 31st. Congress, 1st Session. (Senate) Ex. Doc. No. 64, pp. 79, 80.

men of old, buried though they were in regions so difficult of approach, knew how to build their home with as much art as the people whom we have been in the habit of looking upon as the initiators of civilization.

"This room," says General Simpson, "is fourteen feet wide by seventeen and a half feet long, and ten feet in elevation. It has an outside door-way three and a half feet high by two and a quarter wide, and one at its west end, leading into the adjoining room, two feet wide, and at present, on account of rubbish, only two and a half feet high. The stone walls still have their plaster upon them, in a tolerable state of preservation. On the south wall is a recess or niche three feet two inches high by four feet five inches wide and four feet deep. Its position and size naturally suggested the idea that it might have been a fireplace; but if so, the smoke must have returned to the room, as there was no chimney outlet for it. In addition to this large recess, there were three smaller ones in the same wall. The ceiling showed two main beams, laid transversely; on these longitudinally were a number of smaller ones in juxtaposition; the ends being tied together by a species of wooden fibre, and the interstices chinked in with small stones. On these again transversely, in close contact, was a kind of lathing of the odor and appearance of cedar, all in a good state of preservation." Jackson, who visited these ruins twenty-eight years later than General Simpson, did not find this room north-west of the main building,¹ but he mentions others no less curious, which were reached by holes made in the masonry, the first story alone having a series of little windows. The walls of the Chetro-Kettle Pueblo measured 935 feet long by forty high, and contained 315,000 cubic feet of masonry. When we remember that each stone making up this sum total had to be hewn from the quarry, carried a considerable distance, dressed and set in its place; further that the posts had to be brought from a long way off and the openings to be made, it is difficult

¹ "Ruins of S. W. Colorado in 1875 and 1877," p. 439.

to avoid concluding that a great number of workmen, directed by skilful architects, must have been employed on this building, which at least in the art of masonry, marks an advanced stage of culture.

The same remarks apply with equal force to a pueblo on the banks of the Las Animas River, which flows into the San Juan about sixty miles from the Chaco Cañon. This pueblo has been visited by the Hon. L. H. Morgan, and described by him with scrupulous fidelity.¹ The chief building, 368 feet, and its two wings, 270 feet long, are higher than any others yet discovered. They contained five, perhaps even six, stories, and seventy rooms or cells on each story. The walls, never less than two feet, are here and there three feet six inches thick. Some of the rooms communicate with each other by trap-doors; others have two doors and four lateral openings, small enough, it is true, but at least admitting air and light, luxuries nearly unknown amongst these people. There too we find estufas; there are two in the principal structure, a third in a building annexed to it, and a fourth, sixty-three feet and a half in diameter, rises in the centre of the court.

There are other pueblos, nearly as large, in the valley of Las Animas, but Morgan estimates its population at only five thousand at a time when all the pueblos were inhabited.

At the other end of New Mexico there are ruins no less remarkable,² and there is so great a resemblance between them and those we have been describing that it is impossible not to attribute them to the same races and the same period. These pueblos are scattered over the whole of that part of the valley of the Rio Grande bounded on the north by the Rio de las Frijoles, on the south by the San Domingo, on the east by the plateau stretching away to Santa Fé.

We choose from among these ruins those in the valley of the Rio Pecos, a little river flowing into the Rio Grande, in

¹ "On the Ruins of a Stone Pueblo on the Animas River in New Mexico," *Am. Assoc. St. Louis*, 1877. "Report, Peabody Museum," vol. II., p. 536.

² A. F. Bandelier: "Report on the Ruins of the Pueblo of Pecos," *Arch. Institute of America*, Boston, 1881.

the neighborhood of which are found rich *placetas*, as the Spanish called mines containing precious metals, and *cerillos*, in which blue and green turquoises are still found. Bandelier has recently visited the Rio Pecos valley, which is from twenty to twenty-five miles long by six to eight wide, and is situated at a height of six thousand three hundred and forty-six feet.¹ We cannot do better than follow his description of the chief buildings, supplementing it, however, from other sources, and will retain the initials A and B, by which he designates two groups, the name and history of which are both completely unknown.

The Pueblo B rises on a mesa overlooking the Rio Pecos. Its foundations rest on siliceous rock, and the arrangements of the building vary according to the sinuosities or asperities of the site, so that they are far from presenting that regularity which strikes us so forcibly in the pueblos of the Chaco or of the MacElmo. The building is four hundred and forty feet long by sixty-three at its widest portion. It has no lateral wings, no internal court, and for the first time we find no *estufa*. As many as five hundred and seven cells have been counted, separated by very thin division walls. The largest measure nine feet by sixteen, the smallest seven feet by nine. Bandelier estimates their height at seven feet and a half, and if his calculation be correct the total height of the building would be thirty-six feet. How could such a tiny place be the home of a human being?²

Very different layers can be made out in the masonry; some are of gray or red schistous sandstone, others of a conglomerate formed of a quantity of stones varying in size from that of a pea to that of a nut. One part only, considered the most recent, is of adobes of considerable size, measuring eleven inches by six. The inside surface of the masonry

¹ Emory: "Notes of a Military Reconnoissance from Fort Leavenworth in Kansas to San Diego in California." Washington, 1848.

² Castañeda de Nagera: "Relation du Voy. de Cibola." Juan Jaravillo: "App. VI., Ternaux Compans," series I., vol. IX. G. Castaño de la Cosa: "Memoria del Descubrimiento que —hizo en el Nuevo Mexico," Mexico, 1590; Doc. ined. de los Archivos de Indias, vol. XV., p. 244.

is covered with a very carefully spread white coating, the constituents of which could not be determined, and the walls are strengthened with posts of cedar or pine wood imbedded in the masonry in their natural state, only the bark having been removed. Other posts served as supports to the floor, consisting of brushwood, chips of wood, and a thick coating of moistened clay, this arrangement being the same as that described above. No trace has been found of side-doors or staircases; the different stories, which are placed one behind the other, were reached by trap-doors. Castañeda, speaking of one of the earliest of the expeditions of the Spanish, that of 1540, in which he took part, relates that the roof of the houses formed terraces, by which the inhabitants passed from one to the other. Such doubtless had also been their mode of communication. We may add that it is the plan still in use amongst the Indians of Zuñi, Moqui, Acoma, and Taos; no change has taken place in these secular customs.

In one of the rooms some cinders and fragments of charcoal have been picked up, sole traces of the domestic hearth. It was impossible to ascertain what method was employed to ensure the escape of the smoke, but this was probably because of the state of dilapidation in which the building was found, as General Simpson describes a hole for the escape of the smoke exactly above the hearth in the San Domingo Pueblo.

Pueblo A. is situated on the north of Pueblo B. It includes several buildings surrounding a court. The height of these buildings must have varied very much; that on the east was five, that on the north two, and that on the south four stories high.¹ Bandelier gives the size of the court as two hundred and ten feet by sixty-three. The perimeter of the whole is one thousand one hundred and ninety feet, and as many as five hundred and eighty-five rooms have been counted. This pueblo is the largest hitherto discovered. Its construction differs in no respect from that of those already described; no staircase, window, or hearth is to be

¹ Bandelier, *l. c.*, p. 78.

seen, and three little estufas recall the usual customs of the people under notice. Mr. E. Lee Childe, in a recent publication (*Correspondent*, 10th Nov., 1881), describes an Indian village of New Mexico which he had just visited. "Before us," he says, "on the right and the left, are two rows of these adobe habitations, low, with no openings outward, no doors, no staircases. The flat terraced roofs are reached by a movable outside ladder. All the windows and doors open on to an inside court, which can only be reached by going down another ladder. Each house is thus a kind of little fort, into which, the ladder once withdrawn, neither man nor beast can penetrate. This tribe forms part of the Pueblo Indians, who have adopted agricultural customs, cultivating the ground and breeding cattle." Does not this read like a description of the ancient dwellings we are endeavoring to make known?

Round about the pueblos and inside the different cells have been picked up innumerable fragments of pottery, arrow-points, chips of obsidian, black lava, agates, jasper, quartz, stone axes and hammers, and copper rings. Among these objects we must mention especially two little earthenware figures, very like the idols of the Mexicans. Thus far this is the only fact that throws any light on the religion of the inhabitants of the pueblos.¹

This habitation in common, these cells all exactly resembling one another, with the absence of any larger residence, point to the conclusion that the men of the pueblos led a communal existence.² "The next morning," says a recent

¹ The researches of Mr. Frank Cushing at the Zuñi Pueblo will doubtless throw a flood of light on the whole subject. The few preliminary words which have appeared in the *Century Magazine* and elsewhere promise the most interesting results. Mr. Cushing is now (1884) about to prepare his final report. Ant. de Espejo: "El Viaje que hizo en el anno de ochenta y tres." Hakluyt, "Voyages," vol. III. If we accept Coronado's account Pecos was already in ruins in 1540. Later, under the direction of the Franciscans, the pueblo was rebuilt, a church and convent erected, and in 1680 the population exceeded 2,000. Vetancurt: "Cronica," p. 300. Bandelier, *l. c.*, p. 120 *et seq.*

² Bandelier, *l. c.*, pp. 54, 60, 89, *et seq.* Force, Cong. des Am., Luxembourg, 1877, p. 16.

traveller, "I was waked at dawn by a strange chant. Having at once drawn aside the curtains of the ambulance, I dimly made out the profile of the chief, who was standing at the summit of the pueblo. When he had finished chanting, he gave out a proclamation. He had scarcely finished when I saw figures moving rapidly. It was explained to me that the chant of the chief was an act of adoration, and the object of the proclamation was to make known what was to be the task of the different families made up of the five hundred persons living in the pueblo." The present may help us to understand the past. They were certainly an agricultural race, for every sedentary population must be so from mere force of circumstances. Moreover, near the Rio Pecos cultivated fields have been made out, and irrigative works of considerable extent, including *acequias* or large canals, and *sanjas* or irrigating ditches. This was doubtless the *Huerta del pueblo*, the garden cultivated by all in common. In many places the outlines have been traced of fields in which maize was cultivated, and these fields are remarkable for the luxuriant growth of a robust variety of sun-flower. The common property was under the same kind of government as that generally adopted in Mexico before the Spanish Conquest. The land, the property of all, was divided every year amongst the different families forming the tribe, who were probably very closely related to each other. But each family had a right to the produce of the toil of its members; they reaped the seed they sowed, they gathered the fruits they planted. These assertions seem to be well founded; for according to Mariano Ruiz, who lived for a long time amongst the Pecos Indians, this mode of cultivation was till recently practised by them; in fact it lasted until the extinction of the tribe, and to quote their own words: "La tierras son del pueblo, pero cada uno piede vender sus cosechas."

The Cliff Dwellers and inhabitants of the pueblos have left behind them as many fragments of pottery as the Mound Builders. Jackson tells us that all who have visited these regions have been strongly impressed by the fragments of

pottery everywhere strewing their path, and that even in parts where no vestige of human habitation has been found. The pottery was doubtless of a kind to enable it to last longer than the adobes, which have crumbled to dust. Bandelier, again, in speaking of the ruins of the Rio Pecos, says that wagon-loads of painted pottery lie at the feet of the traveller; and Schoolcraft¹ speaks of the profusion of fragments of pottery left behind them by the ancient tribes who lived on the banks of the Rio Gila, as proofs of their long residence there. Holmes is even more explicit, and, according to him, the number of these fragments is quite confusing.



FIG. 104.—Vases found on the banks of the San Juan.

On a surface, roughly estimated at ten feet square, he was able to pick up fragments belonging to fifty-five different vases, jars or amphoræ, dishes or bottles. All explorations lead to the same results, and everywhere the heaps of fragments of all kinds are of much greater importance than those found at the present day near villages occupied by sedentary Indians. To explain this, recourse has been had to a strange supposition. It has been said that the inhabitants of the country, forced to flee before a sudden invasion, had broken their crockery before leaving their hearths forever—either under the influence of a superstitious horror, or to

¹ "Archives of Aboriginal Knowledge," vol. III., p. 83.

prevent their property becoming the booty of a hated enemy.

What is more certain is, that the pieces of pottery found on the surface of the ground show no signs of deterioration, although they have been subjected for centuries to all the inclemencies of the seasons. Generally, the earthenware of the Cliff Dwellers is far superior to that of the Mound Builders (fig. 104); it was made of a fine clay, very plentiful in the neighborhood of the homes of the Cliff Dwellers, and, to give it con-



FIG. 105.—Funeral urn found in Utah.

sistency, this clay was mixed with a small quantity of sand, bits of shell, or even with pellets of earth moulded and baked. Often after kneading his clay, the potter cut it into thin strips, which he laid one upon the other, giving them the form required with his hand. This is the mode still employed in the glass-works of Europe in making crucibles and other things requiring delicate workmanship. We give a figure (fig. 105) of a jar, or funeral urn, found in Utah, near a structure of adobes now completely in ruins.¹ This illustration will help us to understand the details of the manu-

¹ This jar belongs to the Peabody Museum, and is capable of holding three gallons; another, found near Epsom Creek, holds no less than ten gallons.

facture. All the pieces of pottery found had been subjected to the heat of fire; and, although that heat had never been great enough to change the original color of the clay, the baking had made them so hard that, when struck, they give out a very clear metallic sound. Lightness was evidently a quality much esteemed; the internal and external surfaces were carefully smoothed before baking, and the workman often succeeded in making the body of the largest pots no thicker than a quarter of an inch. A great many of these pots retain traces of paintings, and several have been coated with a varnish converted by baking into a brilliant polish, worthy to be compared with that of our modern enamelled manufactures. Beneath some sepulchral mounds near the Great Salt Lake have been found some pieces of pottery, inferior in execution to those of Ohio and Mississippi, which still retain this polish. These jars contained burnt human bones, yet another proof of the practice of cremation at certain periods by certain races.¹

The varnish was generally black, blue, or brown, more rarely red or white. We do not know what were its constituents; they varied probably according to the locality. We know for instance that the Spanish found some vases in the pueblos that were full of varnish ready for use,² and at the present day the people of Guatemala use a resinous gum to coat the surface of their pottery when they take it from the fire.³ A vase is mentioned found at Ojo Calienta, New Mexico, still covered with a very fine powder of mica; so that this may have been yet another mode employed.

The decoration of the vases is generally executed with great precision; the ornaments stand out from the surface either in relief or in a different color.⁴ Some, for instance, are black on a red or white ground. A few of the fragments picked up are of a bronze color, but it is impossible to say

¹ Bancroft : *Loc. cit.*, vol. IV., p. 714.

² "Castañeda de Nagera : "Rel. du Voyage de Cibola," Ternaux Compans, vol. IV., first series.

³ Bancroft : *l. c.*, vol. I., p. 398.

⁴ Ch. Rau : "Indian Pottery," "Smith. Con.," 1860, vol. XVI.

by what processes this color was obtained.¹ Fragments have also often been found on which lines and geometrical drawings have been traced, as among the Mound Builders, with a pointed instrument or with the nail of the potter; other vases have more complicated designs, which by a very remarkable coincidence resemble to a positively confusing degree those of the Etruscans (figs. 104 and 106). The drawings on the pottery of Arizona resemble the ornaments traced on the walls of the temple of Mitla, which again recall the processes used in ornamentation by the ancient people of Italy.²



FIG. 106.—Fragments of pottery.

Other pieces of pottery are covered with representations of human figures and of animals. A fragment is mentioned as having been found on the banks of the Gila on which an unknown artist had engraved a turtle; another was supposed to represent the head of a monkey. Birds are numerous, and while the Mound Builders appear to have preferred the duck as a model the Cliff Dwellers generally chose the owl

¹ Putnam : *Bull of the Essex Institute*, 1880.

² Hoffman : "Ethn. Obs. on Indians Inhabiting Nevada, California, and Arizona," U. S. Geol. Survey, 1876, p. 454. The modern pueblo pottery, which is produced in enormous quantities, begins to show evidences of the influence of civilization and of modification for an archaeological market. Collectors should be on their guard against pots with the "Swastika" on them, or other equally remarkable designs, which are now, it appears, manufactured to order. Cf. Putnam : "Peabody Museum Report," for 1882.

or the parrot. To sum up: if the pottery of the Cliff Dwellers is superior to that found in the mounds it still more excels that now manufactured by the potters of the Rio Grande or of the San Juan. The Moqui and Zuñi Indians know very well how to make pottery, and to produce the symmetrical forms or artistic ornamentation characteristic of the ceramic work of their predecessors inhabitants of the pueblos.

A few implements of quartz or other rock of various kinds are, with the pottery just noticed, nearly the sole relics of this ancient civilization which have come down to us. Arrow-points are often found at the foot of the cliff-houses and round about the pueblos. They bear witness, as we have already remarked, to the constant struggle in which the men under notice passed their lives, compelled to be always defending their homes. Near the Rio Mancos has been found a polished celt exactly similar to those of Europe.¹ This celt was eight inches long by two and a half at its widest part. One side is slightly concave, the other perfectly flat. It was hidden in one of the cells of a cliff-house under a heap of maize. A polished scraper of silicious schist has also turned up, which may have been used to prepare skins, schist being too brittle to be used either for drilling or hammering purposes.

A good many metates or stone hand-mills for grinding corn have also been found. These consist of blocks of basalt, naturally concave or artificially rendered so, upon which another stone was pushed backward and forward, which fact supplies us with another proof that the Cliff Dwellers were an essentially agricultural people, living on the produce of the fields they tilled. These metates are at present in common use on the borders of Mexico, both by Indians and by the not much more civilized "greasers." It is a curious fact that these people often obtain their metates, here, as in Yucatan, from the ancient pueblos or mounds.

Lastly, a mat made of rushes may be referred to, of a

¹ Holmes: U. S. Geog. Survey, pl. XLVI.

variety (*Scirpus valictus*) still very common on the banks of the Mancos. Some ropes woven of the fibres of the yucca, some sea-shells, a few amulets in stone or turquoise, a few bead necklaces, and our list is closed. We have alluded to the very small number of excavations hitherto undertaken, and the obstacles which checked the explorers, zealous as they were in the cause of science; and it will readily be believed that very few of the objects left on the surface of the ground were likely to escape the rapacity of the Utes and Navajos, who are always wandering about amongst the ruins.

It is remarkable that, except for the copper rings found at Pecos, not a weapon or ornament of metal has been found.¹ Were such articles carried off by the Indians, or were the early inhabitants of the pueblos of New Mexico and Colorado ignorant of iron and bronze? This latter hypothesis seems probable, for the roughly squared beams supporting their home appear to have been shaped with stone implements. We cannot pronounce a decided opinion on the question, for it can only be decided by scientifically conducted excavations.

Among the most remarkable characteristics of the archæology of the region are the paintings, sculptures, and engravings on rocks, met with in New Mexico, Arizona, Colorado, and even in Texas. Among others which may be cited are those of the Sierra-Waco, thirty miles from El Paso.

These rock-drawings have caused the coinage of a new word, *pictography*, which we use in our turn, although we are by no means persuaded, as are certain archæologists, that the Cliff Dwellers intended by means of pictography to give a record of their own history, the struggles in which they had taken part, their migrations or their haunts. The figures are, as a rule, of such great simplicity that the descendants of the artists could learn nothing from them of the main facts of the history of their ancestors. It is more probable that these figures, curious though they be, were generally the outcome of the painter's or sculptor's fancy.

¹ "The implements and ornaments are not numerous, include no articles of any metal whatever, and do not differ materially from the articles now in use among the Pueblo Indians."—Bancroft, *l. c.*, vol IV., p. 677.

It is not only on the rocks that we find the representations under notice ; the numerous erratic blocks of the valley of the Gila are covered with roughly outlined figures of men and of animals ¹ (fig. 107). But it is chiefly on the banks of the Mancos and the San Juan, and in the cañons stretching



FIG. 107.—Erratic blocks covered with figures. Arizona.

away westward, that these pictographs abound. Some are cut into the rock to a depth varying from a quarter to half an inch ² (figs 108 and 109) ; others are merely traced in broad red or white lines. The former, in many cases at an

¹ Bartlett : "Personal Narrative," vol. II., pp. 195, 206.

² Holmes : pls. XLII, and XLIII.

all but inaccessible height, must have involved considerable toil. Are they the work of the Cliff Dwellers? Nearly every thing points to the conclusion that they are, for they are almost all near the cliff-houses. We must add, however, that inscriptions and figures are, on the other hand, very rare near the most ancient pueblos; and the most recent are often, perhaps, of later date than the Spanish Conquest. The appearance of these inscriptions might have warranted us in attributing them to pre-historic Cliff Dwellers, had not one of them represented a horse,¹ and we know that this animal was unknown in America before the arrival of the conquerors.

We must also notice a figure resembling rudely a hatchet (fig. 109), met with repeatedly in these engravings. Its form recalls the hatchets engraved on the megalithic monuments of Brittany. This is a curious fact, but its importance must not be overrated.

Among the most interesting of the engravings on rock we will mention one on the banks of the San Juan, about ten miles from the mouth of the La Plata. It represents a long series of men, animals, and even birds with long necks and long legs, all going in the same direction.² Two men are standing up in a sledge harnessing a deer which may be supposed to be a reindeer, and other men follow or direct the march. These engravings are evidently connected with the migration of a tribe.

Jackson also speaks of a cliff near the MacElmo covered for an area of sixty square feet with figures of men, stags and lizards, and Bandelier speaks of pictographs³ the weather-worn condition of which testifies to their antiquity. The latter, situated near the Pecos ruins, represent the footprints of a man or child, a human figure and a very complete circle enclosing some small cups which may also be compared with those on the megalithic stones of France. On the

¹ Holmes: pl. XLII., fig. 2.

² Holmes: pl. XLIII., fig. 1.

³ "Ruins of the Rio Pecos," pp. 92, *et seq.*

banks of the Puerco and Zuñi rivers,¹ two of the tributaries of the Colorado Chiquito, drawings have been noticed² which resemble hieroglyphics. Their meaning is unknown, indeed we cannot even assert that they have any meaning.

The rocks surrounding Salt Lake City, Utah, the capital city of the Territory, are covered with sculptures which remind us of those of Egypt.³ Some of the human figures of



FIG. 108.—Pictography on the banks of the San Juan.



FIG. 109.—Pictographs on the banks of the San Juan.

life size, incised in very hard blue granite, are situated more than thirty feet above the level of the ground. The height at which some of these sculptures occur has suggested that since their production some geological phenomenon, such as the depression of the lake, may have taken place.

¹ It was on the banks of the Zuñi that Coronado speaks of having seen the seven villages of Cibola in 1540.

² Mulhausen: "Tagebuch einer Reise vom Mississippi nach den Küsten der Sud-See," Leipsic, 1858.

³ Remy and Brenchley: "A Journey to the Great Salt Lake City." London, 1862, vol. II., p. 362.

This is yet another hypothesis to add to the many already noticed.

The desire to reproduce the figures, animals, and events which have arrested their attention is one of the most characteristic features of the various American races. On the rocks of Ohio and Wyoming signs have been noticed which have been looked upon as hieroglyphics.¹ Amongst these engravings one of the most important is in Licking county; it covers a surface from fifty to sixty feet long, by from ten to twelve feet wide. Unfortunately nearly all the figures have been destroyed, only a few slight traces still remaining. We may also mention those of Perrysburg and Independence, Cuyahoga county, and those of Belmont county. If these really are inscriptions it is impossible now to decipher them, but there is little probability of their being more than rude pictographs. Here and there beside these signs we see engraved a trident, an harpoon, a bear's foot or a human hand or foot, several of which are mentioned as cut into the rock to the depth of an inch and a half.

In Vermont, too, the rocks bathed by the Connecticut River are covered with engravings. On one of them a human figure can be made out, on another twenty heads of different sizes, the largest being twenty inches long and the smallest five inches.² Several of them have two rays, two horns if you like, on the forehead, and the central figure has as many as six. The eyes and the mouth are indicated by circular holes, and the nose is nearly always missing. An engraving at Brattleboro is still more curious; it represents eleven different subjects, including mammals, birds, and serpents.

Some similar pictographs, to which authorities are disposed to assign a very great antiquity, are to be seen on the walls of caves in Nicaragua.³ One is mentioned near Nihapa

¹Whittlesey: "Rep. Am. Ass.," Indianapolis, 1871. Th. Comstock, same, Detroit, 1875.

²G. W. Perkins: "Remarks upon the Arch. of Vermont," "Rep. Am. Ass.," St. Louis, 1878.

³"Report, Peabody Museum," 1880, vol. II., p. 716.

representing a serpent covered with feathers. The artist gave imagination full scope. Some caves in the mountains of the province of Oajaca also show man's handiwork.¹ But here we only find clumsy paintings in red ochre. Amongst these can be distinguished impressions of the hand in black, recalling those noticed by Stephens on the ruined walls of the buildings of Uxmal. Pinart, in his journey across Sonora,² met with a great many inscriptions on rocks. He describes one engraved on the three faces of a basaltic rock near the Rio de Busanig. Although they are much defaced, we can still make out on the northern face a human hand, beneath two concentric circles grouped round a central point. The upper part also bears a number of little round holes arranged symmetrically, and on a second rock rising above the first several other circles have been traced.

Near Cahorca rises a rocky circular hillock to which the Papagos have given the name of *Ko Ka*. It consists of a heap of rocks bearing pictographs on their flat surfaces. In several places more ancient designs, including a series of lines or of symmetrical figures, can be distinguished, but they have been in a great measure obliterated by later inscriptions traced in white paint.

Such engravings or paintings are met with in all the regions which once formed Spanish America. They are mentioned as existing near the extinct volcano of Masaya, in the United States of Colombia; on the banks of the Orinoco, in Venezuela, where they are in such a state of decay that they can hardly be recognized; on the Isthmus of Panama, where they were noticed as early as 1520 by the Spaniards.³ Lieutenant Whipple describes them on the rocks of Arizona. Professor Kerr on the Black Mountains near the sources of the Tennessee; and in crossing the White Mountains, between the towns of Columbus, Nevada, and Benton, California, we meet with numerous representations of men and animals, or

¹ Brasseur de Bourbourg: "Voy. sur l'Isthme de Tehuantepec," p. 123.

² "Bull. Soc. Géog." Paris, Sept., 1880.

³ Diego Garcia de Palacios: "Carta dirigida al Rey de España," año 1576.



FIG. 110.—Specimens of the rock sculptures of the Bushmen of South Africa.

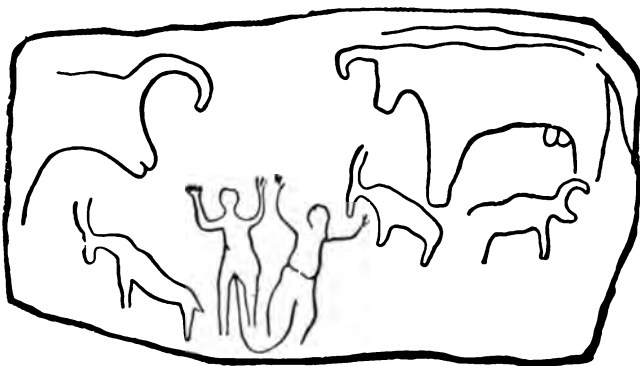
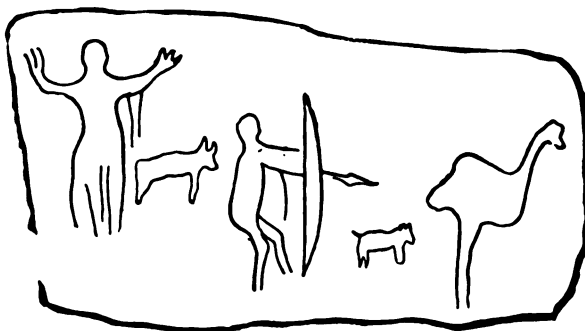
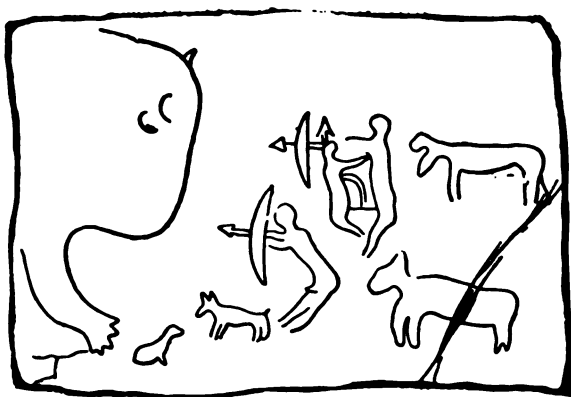


FIG. III.—Engravings found on rocks in Algeria.

with signs that cannot be deciphered.¹ Neither the Pah Utes, occupying the California seaboard, nor the Shawnees, who encamp near Columbus, claim them as the work of their ancestors. Twenty miles south of Benton, the road follows a narrow *defile*, shut in on either side by almost perpendicular rocks, rising to a height of forty or fifty feet. These stone walls are covered with figures of unknown origin.

The ancient inhabitants of Tennessee have also left behind them paintings on the cliffs overlooking their great rivers. Some represent the sun and the moon; others, mammals, the bison for instance.² These paintings were done in red ochre, and, like the sculptures of Utah referred to above, they are at almost inaccessible heights. A colossal sun, engraved on a rock overlooking the Big Harpeth, is visible four miles off. At Buffalo Creek these workmen of the past have drawn an entire herd of bisons, walking in single file. Father Marquette, during his voyage up the Mississippi, saw similar scenes engraved on the cliffs between Illinois and the Missouri; and more modern travellers bear witness to the faithfulness of his account.³

In speaking of South America we shall describe rock sculptures, similar to those first noticed; but with regard to them we shall also be unable to say who executed them or when they were made. The only conclusion which we can arrive at is that resemblances exist between the instincts of man in all regions. Everywhere man, however degraded we may consider him to have been, traced as with childish vanity, upon the rocks, on the walls of caves, and on erratic blocks, his own image or the scenes taking place before his eyes, and from this point of view nothing could be more curious than a comparison between the rude figures of the Americans and the engravings executed by the Bushmen of South Af-

¹ Hoffman: "Ethn. Observ. on Indians Inhabiting Nevada, California, and Arizona," U. S. Geol. and Geog. Survey, 1876.

² Jones' "Antiquities of the Southern Indians," New York, 1873, p. 137.

³ "Voyages et Découvertes du P. Marquette dans l'Amérique Septentrionale," Thevenot: "Relation de Divers Voyages Curieux," Paris, 1681. J. G. Shea "Discovery and Explorations of the Mississippi Valley," p. 41.

rica, (fig. 110), or with those engraved on the rocks of Algeria. This similarity, in every clime and at every period, of the taste, instinct, and genius of man is the best proof that can be brought forward of the common origin of the human race.

As already stated it appears certain that the Cliff Dwellers and the inhabitants of the pueblos belonged to the same race, and that this did not materially differ from the Moquis and Zuñis of the present day. The buildings, whether of stone or of adobe, are always alike and always regular; the rooms are everywhere extremely small; the absence of stairs and of trap-doors giving access from one story to another, points to a life led in common; and everywhere we find estufas, places for meetings alike of a religious and secular character. Both the Cliff Dwellers and the people of the pueblos manufactured pottery of a similar kind, and used the same kind of arrow-points and the same kind of implements.

All the relics which have come down to us point to the same conclusion, and it appears no less certain that the people under notice differed in many respects from the Mound Builders of Ohio and Mississippi, the Mayas of Yucatan and the Nahuas of Mexico. There are no structures left by the Cliff Dwellers resembling either the truncated pyramids, mounds shaped like animals, or other earth mounds of the Northern United States. In the Territory of Utah, however, Dr. Parry found a mound containing several specimens of pottery a good deal like that of the pueblos. Dr. Palmer, after many excavations in the neighborhood, confirmed this fact, but added that the mound in question was derived from crumbled walls, originally of adobes.

Still less do they resemble the palaces, temples, and remarkable buildings erected by the Mayas or the Aztecs. The rarity of pipes, which are so numerous amongst the Mound Builders and northern Indians is no less remarkable. We give a drawing (fig. 112) of one of the few pipes found as yet in the district inhabited by the Cliff Dwellers. It is of clay, and the mouth-piece is at the end of the handle.

Coronado, the first Spaniard to visit these regions, notices no resemblance between the Mexicans and the inhabitants of New Mexico. Father Escalante, who crossed the country in 1776, more than two centuries after Coronado, describes ruins now unknown, pueblos inhabited when he saw them, now crumbled to dust; and nothing in his narrative supports what has been called on the other side of the Atlantic the Aztec theory.¹ As yet, nothing justifies us in deciding that New Mexico was peopled by colonists from Anahuac. Two distinct classes of remains appear to have been observed in Central America; the Cliff Dwellers on the west and the Mound Builders, who have been identified by some with the Aztecs, on the east. These people may have sprung originally from the same source, but their separation doubtless



FIG. 112.—Pipe found amongst the relics of the Cliff Dwellers.

took place at a very distant period, and there is not sufficient evidence yet available to prove the case one way or the other.²

One thing is certain: numerous pueblos existed in New Mexico at the time of the Spanish invasion, and some of them, such as Zuñi, Acoma, Taos, Jemez, and Pecos have

¹Dominguez and Escalante: "Diario y Derrotero Santa Fe a Monterey," 1776. "Doc. Hist. Mex.," 2d series, vol. I. Short, p. 331, speaks of having examined a MS. by Escalante in the Library of Congress, Washington, which confirms this conclusion.

²In the fifth report of the Archæological Institute of America Bandelier gives an account of studies carried on in 1883 for the society in New Mexico and Arizona. He finds a well-defined system of growth, from the temporary Indian lodge to the many-storied pueblo building, which clearly does not owe its origin to any external influences. He has since been seeking in the mountains of Northern Mexico traces of any possible connection between the ancient pueblo people and the Aztecs, and it is announced that his report of important studies at Cholula and Mitla is nearly ready for publication.

been inhabited until now. The pueblos of the sedentary Indians of New Mexico are grouped as follows: I., between the frontier of Arizona and the Rio Grande, Zuñi, Acoma, and Laguna; II., on the banks of the Rio Grande Taos, Picuries, Tehua, Queres, Tiguas, and Piros; III., to the west of the Rio Grande, Jemez; and IV., to the east of the same river, Tanos and Pecos.

Lieutenant Wheeler, who visited the country in 1858, speaks of having seen through his telescope two Moqui pueblos, at a distance of eight or ten miles, perched on a rock overlooking the whole valley. The buildings were flush with the precipice, and from the Lieutenant's point of view presented the appearance of a town with walls and crenelated towers. The whole was singularly picturesque. Each of these pueblos is built round a rectangular court, enclosing the spring of water indispensable to the population. The walls, which are of stone, have no opening on the outside. To reach the inside, these walls would have to be either removed or scaled. The different stories of the houses are one behind the other, and the upper ones can only be reached by means of trap-doors in the ceiling. Every building includes three stories, and has no opening except on to the court. The whole arrangement is such as to offer resistance in case of attack. As the court and the communications are common to all, the inhabitants must have led a communal existence, such as is known to be characteristic of all American tribes.

We might well take this account as a description of an ancient pueblo, and it will help us to a second conclusion, which follows as a matter of course. New Mexico, Arizona, Utah, Colorado, and the northern part of Chihuahua, were formerly inhabited by a sedentary agricultural and comparatively cultured race, who differed no more from each other than do the present inhabitants of the pueblos. The decline of these people probably began some time before the arrival of the Spaniards, and this decadence has gone on until the present day, when a few scattered settlements are the

sole representatives of a once numerous and powerful population.

The causes of this decadence are many. Among the most important we must certainly include the perpetually recurrent invasions of the Apaches, wild and dangerous enemies whom the Cliff Dwellers long and energetically resisted. At last, however, this resistance became powerless to stem the torrent, the people had to leave the homes they had built, the hearths often watered with their blood, perhaps to join themselves to other tribes at a distance,¹ who in their turn had to defend themselves, probably with no better success, against the attacks of the same enemies.

The enemies gained ground daily, and daily the Cliff Dwellers receded before them. The end was inevitable. The vanquished race was rapidly reduced in power and number, and unfortunately the Spanish conquest could not restore it. It is probable, however, that the inroads of the nomad tribes, however formidable they may have been, would not have been enough to depopulate the country. The aerial dwellings, so difficult of access, the towers defending the entrances to the valleys, the arrangement of the pueblos, forming as they did regular fortresses, would have secured the victory to their inhabitants, had not another cause, already referred to, hastened their ruin. The destruction of the forests, prolonged droughts, and the disappearance of water-courses changed lands which had been rendered productive by cultivation into arid deserts and valleys choked with sand, which strike the traveller of to-day as so melancholy. Man fled from regions where further struggle with an ungrateful nature had become impossible. He receded before an enemy more dangerous than the nomads, and against whom resistance was impossible.

It was reserved to the nineteenth century to ascertain

¹ Examples of similar union of tribes are not rare in the history of the Indians. Since the discovery of America the vanquished Tuscaroras have been admitted into the confederation of the Five Nations; the Alabamas, the Uchees, and Natchez into that of the Creeks; and in our own day the Pecos, decimated by sickness, found an asylum amongst the people of an allied tribe.

these facts, totally unknown a few years ago. A more noble mission is reserved to those who are to come after us. It is for science to reestablish that which the barbarism of man has been permitted to destroy, and by the resources of modern science to make the desert blossom as the rose.

CHAPTER VI.

THE PEOPLE OF CENTRAL AMERICA.

AMERICA does not stint her surprises for those who study her ancient history. We have spoken of the mounds, so strange alike in form and construction, the dwellings, true eagle's nests, formed amid perpendicular cliffs, the pueblos, where a considerable population lived in common. We shall now consider a more advanced state of culture, monuments in ruins at the time of the Spanish invasion, temples, palaces, monoliths, statues, and bas-reliefs recalling in their complexity those of Egypt or Assyria, India or China. These monuments extend over entire districts, and the pioneers who cut their way, axe in hand, through the all but impenetrable forests, flattering themselves that they were the first to tread the virgin soil, found themselves face to face with ruins and sepulchres, incontestable proofs of the former presence of generations now disappeared. In stating these facts we shall incidentally confute the error of an eminent historian who did not hesitate to assert that there were not throughout the whole of America any traces of a single building of earlier date than the fifteenth century.

The difficulties we meet with at every turn increase as our account proceeds. Here too we are in the presence of nameless people, of races without a written history; and to add to our difficulties new discoveries are daily made, upsetting preconceived hypotheses, breaking down earlier theories, and completely destroying what had appeared to be the best founded conclusions.

The myths and traditions that have been collected may date back to a time before the Christian era, but the hiero-

glyphics (fig. 113) are certainly not so old. It is difficult on such slight data to reconstruct a past culture, the very existence of which was unknown a few years ago; and thus far no Champollion has arisen to solve the enigmas which have been preserved in stone.¹ Before examining the monuments themselves we must sum up the opinions of modern historians, who have thrown a little light where, before their researches, nothing but obscurity and chaos existed.

One fact appears probable, and that is that there was a tendency of population extending over a long period from the north toward the south,² one driving another before it as one wave of the sea follows that in advance of it. We cannot do better than compare these successive invasions, with those of the barbarous races that quarrelled over the parts of the dismembered Roman empire, or with that of the Aryans, who from the farther end of Asia fell in hordes first upon India and Persia and then upon the different countries of Europe, giving to the vanquished as the price of their defeat a culture undoubtedly superior to that they had formerly possessed.

The people who successively established themselves in

¹ The twelfth century of our era is the limit of our very incomplete historical knowledge of America. All that has come down to us of earlier days are a few ethnological facts and legends or fables usurping the place of truth. With such materials hypothesis has run wild. The Abbé Brasseur de Bourbourg ("Popol-Vuh," Introd.) says that in 955 B.C. there was in America a settled government. The chronicle of Clavigero ("St. del Messico," book II. ch. I.) commences 596 years before our era. Veytia ("Hist. Ant. de Mejico," t. I., chap. II.) dates the first migrations of the Nahuas from the year 2,237 after the Creation; while Valentini ("The Katunes of Maya History") by a more reasonable calculation places them 137 years after Christ. Ixtlilxochitl ("Hist. Chichimeca," Kingsborough, vol. IX.) in his turn gives the year 503 A.D. as the date of the foundation of Tezcuco. All these dates, however, are, we repeat, merely fanciful. There is no positive evidence either to confirm or to disprove them.

² Bancroft's opinion, however, is that "while the positive evidence in favor of the migration from the south is very meagre, it must be admitted that the southern origin of the Nahua culture is far more consistent with fact and tradition than was the north-western origin, so long accepted." "Native Races," vol. II., p. 117.

Central America were probably of Nahuatl race. The vigorous researches being made in America itself tend more and more to connect with this single source the Olmecs, Toltecs, Miztecs, Zapotecs, Chichimecs, and Aztecs, and it is to various branches of this conquering race that we owe the ruined monuments still scattered over Mexico, Yucatan, Honduras, Guatemala, and Nicaragua, and found as far as the Isthmus of Tehuantepec.

The earliest were the Mayas, who are also supposed to have been of Nahuatl origin, though we are unable to assert any thing positive on this point, as the traditions, monuments and hieroglyphics which can with certainty be attributed to them, appears to differ from those of the Nahuas, and their language presents striking disparities.¹ The last fact would form a conclusive argument against a common origin, did we not know with what rapidity dialects are transformed, which primitively sprang from a single source,² and if side by side with these differences we did not note remarkable resemblances, such as the monosyllabic words and the similarity in the construction of phrases³; all that we can really say at the present moment is that if the Mayas and the various branches of the Nahuas had really a common origin, their separation certainly preceded the Spanish invasion by a considerable period.

The Mayas are supposed to have dwelt upon the shores of the Atlantic. They migrated probably after defeat, and later established themselves in Chiapas, on the banks of the Usumacinta River, in the midst of a rich and fertile country.⁴

¹ Kingsborough: "Ant. of Mexico," vol. III.; Prescott, "Hist. of the Conquest of Mexico," vol. I., p. 104; Bancroft, "Native Races," vol. II., p. 772.

² Señor Orozco y Berra made out fifteen dialects belonging to the Maya. Among these we may mention the Quiché, Tzendal, and Cakchiquel. Maya or its derivatives was spoken in Tabasco, Chiapas, Guatemala, part of San Salvador, Honduras, and Nicaragua. Some traces of it are perhaps too hastily supposed to have been recognized in Cuba, Hayti, and various of the West India islands ("Geog. de las Linguas," p. 98, Mexico, 1864).

³ Bancroft, "Native Races," vol. III., p. 769.

⁴ Orozco y Berra, *l. c.*, p. 128.

Their empire flourished long, the rule of their chiefs or of the tribes subject to them¹ extended over the greater part



FIG. 113.—Specimen of hieroglyphics found in Central America.

of Central America.² Nachan or the Town of Serpents, of

¹ The Mayas had as many as three districts tributary to them, the Capitals of which were: Tula or Tulan, generally placed two leagues from Ocozingo, Mayapan in Yucatan, and Copan.

² Brasseur de Bourbourg: "Hist. des Nations Civilisées du Mexique et de l'Amérique Centrale"; Bancroft, vol. II., p. 523; vol. III., p. 460, etc.; vol. V., pp. 157 and 231.

which the ruins at Palenqué exhibit the grandeur, was their capital, while Mayapan, Tulan, and Copan, were the chief towns of the tributary districts forming the confederation of Xibalba or of the Chanes (Serpent).

Such are the only at all trustworthy data that we possess. Legends add some details in which a few facts are mixed with much that is fabulous. The Maya confederation, it is said, was founded many centuries before our era, by a messenger of the gods named Votan, who came, according to tradition, from the other side of the Caribbean Sea, and the time of his arrival is placed by the legend ten centuries before the Christian era. Perhaps there may have been several Votans, and the descendants of the first retained his name as a title of honor.

The most ancient traditions made him come from a land of shadow, beyond the seas; on his arrival, the inhabitants of the vast territories stretching between the isthmus of Panama and California, lived in a state which may be compared with that of the people of the stone age of Europe. A few natural caves, huts made of branches of trees, served them as shelter; their only garments were skins obtained in the chase; they lived upon wild fruits, roots torn out of the ground and raw flesh of animals which they devoured while still bloody.¹ Legends have preserved to our day the name of the Quinames, wild and barbarous giants, whose memory filled the Indians with terror, even during the Spanish domination.² Such doubtless were the men who struggled with the large animals which so long roamed as undisputed monarchs in the forests, pampas, and marshes of the two Americas. It is curious that nearly every American tribe has legends of barbarous people who preceded them and to

¹ Torquemada: "Mon. Indiana," vol. I., chs. 15 and 20.

² "Los Quinemetin, gigantesque vivian en esta renconada que se dice ahora Nueva España." Ixtlilxochitl: "Relaciones"; Kingsborough: "Ant. of Mexico," vol. IX., p. 322. Traces are also supposed to have been met with of a more ancient language than the Maya, Nahua, or their derivatives. See Humboldt's "Views of the Cordilleras" (Mrs. Williams' translation, 2 vols. octavo, 1814) and Bancroft, vol. III., p. 274.

whom all evil attributes are attached in the current myths. Sometimes, as among the Eskimo, Aleuts, and northern Tinnah, these mythical nomads are believed to still exist, hidden in the recesses of the mountains or the forests.

All the Central American tribes do not seem to have lived in an equally degraded condition before the period of the Mayas. Ruins of considerable extent are met with in Guatemala. These consist of undressed stones similar to those used in the cyclopean buildings of Greece or Syria; but no tradition refers to their origin. They are, however, attributed with some reason to a race driven back by conquest, and superior in culture to the people overcome by the Maya invasion of Central America.

It was by war that Votan, placed after his death among the gods, established the authority of his tribe, and it was by war that his successors maintained its supremacy. Legends have come down to us of a long series of victories and of defeats, of internecine struggles and foreign wars, alliances broken off, and revolts of tributary people. A manuscript translated by Don J. Perez, called "Katunes of Maya History," gives according to the translator the history of the Mayas from 144 to 1536 A.D., but according to Professor Valentini, who reckons the Ahau or cycle differently, from 142 to 1544. The Katunes give only incidents of war, as if times of peace were unworthy of attention. This manuscript escaped the general *auto da fé* ordered by the Spanish priests in 1569. The name of *Katunes* (from *Kat*, stone and *tun*, to interrogate) was given in Yucatan to engraved stones bearing dates or inscriptions relating to historical events. These stones were imbedded in the walls of public buildings. Every thing points to the conclusion that the inscriptions were not very ancient.¹

In accordance with the general law of human affairs the confederation declined, one invasion succeeded another, and the opposition of the Mayas to their invaders was that of a

¹Salisbury: "Proc. Am. Antiq. Soc.," October 21, 1879. Stephens: "Yucatan," App., vols. I. and II.

worn-out people, no longer able to defend itself against younger and more vigorous races. The result could not be doubtful. Amongst the conquered tribes, some accepted a new usurpation, others retired to Yucatan and Guatemala, where their descendants offered an heroic resistance to the Spanish conquerers.¹

We know very little about the religion, the manners or the customs of the Mayas. Three Maya manuscripts are known: the Codex Perezianus, preserved in the Bibliothèque Nationale at Paris; the Dresden codex, known since the eighteenth century, and long described as an Aztec manuscript; it is published in the large work by Lord Kingsborough; and lastly, the Troano manuscript (named after Señor Tro y Ortolano, one of its owners), found at Madrid in 1865. Some doubts have been expressed with regard to this, and also to a manuscript which figured in 1881 at the American Exhibition at Madrid, and which is looked upon as a continuation of the Troano manuscript.²

The gods of the Mayas appear to have been less sanguinary than those of the Nahuas. The immolation of a dog was with them enough for an occasion that would have been celebrated by the Nahuas by hecatombs of victims. Human sacrifices did however take place, and prisoners of war were chosen in preference; failing them, parents offered up their children as the sacrifice most pleasing to the gods.³

One remarkable distinction is noticed: the office of sacrificer was considered the greatest dignity to which a Mexican could aspire; among the Mayas, on the contrary, it was looked upon as impure and degrading.⁴

At Chichen-Itza, capital of the Itzas, one of the Maya

¹A. de Remsal: "Hist. de la Prov. de S. Vincente de Chyapa," Madrid, 1619, p. 264. Juarros: "Hist. of the Kingdom of Guatemala," London, 1824, p. 14. Bancroft *l. c.*, vol. I., p. 647 *et seq.*; vol. V., p. 616.

²An investigation by Prof. Cyrus Thomas of the Manuscript Troano, throwing much new light upon the subject, is on the point of publication by the Ethnological Bureau of the United States.

³Diego de Landa, "Relacion de las cosas de Yucatan," p. 166; Paris, 1864.

⁴"El oficio de abrir el pecho a los sacrificados que en Mexico era estimado, aqui era poco honoroso." Herrera, "Hist. Gen.," dec. IV., book X., ch. IV.

tribes of Yucatan, these sacrifices were more numerous. A deep excavation was dug in the centre of the town and filled with water. An altar, reached by a flight of steps cut in the rock, rose at the very edge of the precipice. Trees and shrubs surrounded it on every side, and to add to the awe which the spot naturally inspired, a perpetual silence reigned there. In the days of Votan's first successors, in accordance with the instructions of the messenger of the gods, nothing was offered up but animals, flowers, or incense; but by degrees the people went back to the most revolting sacrifices, and in the years preceding the fall of the confederation, if they were threatened with any calamity, such as the failure of the harvest or the cessation of rain, so indispensable in the *tierra caliente*, the populace hastened to gather round the altar, and to appease the anger of the gods with human victims. These victims were generally young virgins; they marched triumphantly to their fate, arrayed in rich apparel and surrounded by an imposing escort of priests and priestesses. Whilst the fumes of the incense rose toward heaven, the priests explained to the virgins what they were to ask of the gods, before whom they were to appear. Then, when the incense was dying out upon the altar, they were flung down into the abyss, whilst the prostrate crowd went on offering up their ardent petitions. In Nicaragua, every one of the eighteen months into which the year was divided opened with a holiday. The high-priest announced the number of victims to be offered up and the names of those he had chosen, either among the prisoners or among the inhabitants themselves.¹ The unhappy wretch thus pointed out was pitilessly seized and stretched upon the altar; the sacrificer walked slowly round him three times, chanting funeral hymns; then he approached, quickly opened the breast, tore out the heart, and bathed his face in the still smoking blood. When the victim was a prisoner the body was at once cut up; the heart belonging to the high-priest, the feet and hands to the chiefs, the thighs to the

¹ Peter Martyr d'Anghiera, "De Orbe Novo," dec. VI., book VI.

warrior who had had the honor of his capture, the entrails to the trumpeters, the rest distributed among the people, and lastly, the head was hung upon the branch of a tree as a religious trophy. If the victim was a child offered or sold by its parents, the body was buried, custom not permitting the assistants to eat the flesh of one of their own people. These sacrifices, which dated from a very remote antiquity, lasted until the Spanish conquest. Herrera¹ relates that several Spanish prisoners were thus devoured, and Alborno adds that in Honduras the Indians gave up eating the flesh of the white victims because it was too tough and stringy.

Sacrifices were always succeeded by several holidays, dancing, banquets, and brutal drunkenness.² Husbands had to refrain from all intercourse with their wives, and the devout pierced the tongue, ears, and other parts of their bodies, and smeared the lips and beard of the idols with the blood from their wounds.³ At other times blood was drawn from the male organ, and some grains of maize were sprinkled with it, for the possession of which the assistants disputed eagerly, believing it to be an aphrodisiac.⁴ In Guatemala a woman and a female dog were sacrificed before every battle. The horror these details inspire is our excuse for cutting short the enumeration. Nowhere was human barbarity greater than amongst the early Americans, and the cruelty of the executioners was only equalled by the stoicism of their victims.

We do not know who the gods were who were supposed to be honored by these revolting sacrifices, and very little has been learned yet about the mythology of the Mayas. Some of their idols represent men, others animals. Peter Martyr

¹ "Hist. Gen. de los Hechos de los Castellanos en las Islas e Tierra Firme del Mar Oceano," dec. I, book V., chap. V.; dec. III., book IV., chap. VII.; dec. IV., book VIII., chap. IX.; book XCIV.

² The Mayas were acquainted with several fermented drinks. The Itzas prepared one of a mixture of cacao and maize. In other parts honey and the juices of the banana, figs, and other fruits, were fermented.

³ Oviedo y Valdes: "Hist. Gen. y Natural de las Indias," Madrid, 1851-54, vol. IV., p. 52.

⁴ Herrera, *l. c.*; Peter Martyr, *l. c.*

speaks of one huge serpent made of stone and asphaltum set up in Yucatan, and we know that the Itzas, greatly struck with the appearance of Cortes' horse, hastened to copy it in stone and place it amongst their idols.

The Mayas knew nothing of iron; copper and gold were the only metals they used, and it is doubtful whether they understood smelting metals. Christopher Columbus is said, however, to have seen, off the coast of Honduras, a boat laden with crucibles, filled with ingots of metal and hatchets made of copper which had been fetched from a distance. Gold was very plentiful at the time of the Spanish conquest, and it was used for making ornaments of all kinds.¹ The weapons in use were slings, spears, arrows, and darts pointed with silex, obsidian, porphyry, copper, or bone. The warriors wore well-padded cotton armor, often so heavy that a soldier once prostrated could not always get up again; their round shields were decorated with feathers and covered with cotton cloth or with the skins of animals which they had killed in the chase. The Mayas were acquainted with navigation. Oviedo relates that the inhabitants of Nicaragua used balsas for crossing the rivers; these balsas were regular rafts of five or six logs, bound together with creepers and supporting a deck of interlaced branches.² The Chiapanecs used calabashes for floats. In other localities navigation was more advanced; the Guatemalians hewed out the trunks of the cedar and the mahogany tree, and their canoes might be counted by thousands on their lakes and rivers. The people of Yucatan used trunks of trees in the same way, and their boats, which they guided with great skill with the help of a steering oar, were capable of holding as many as fifty people. Some say that sailing vessels were also used.

¹Cortes: "*Cartas y Relaciones al Emperador Carlos V.*," Paris, 1866. Herrera ("*Hist. Gen.*," decade III., book IV., chs. V. and VI.) speaks of golden idols and hatchets. Cogolludo ("*Hist. de Yucatan*," Madrid, 1688.) in his turn speaks of little figures representing fish and geese; and Brasseur de Bourbourg ("*Hist. des Nat. Civ.*," vol. II., p. 69), of finely chased vases, all of gold.

²"*Hist. Gen.*," vol. III., p. 100.

A balsa met with by Pizarro, near the second degree of north latitude, and the boat seen by Christopher Columbus, were reported to have been thus rigged¹; but these facts are very much disputed, and we only know that the last-named vessel was of the same length as the Spanish galleys of eight feet beam, that it was manned by twenty-five men, and that in the middle was a canopy of matting to protect the women and children from the heat of the sun.

The houses inhabited by these people were of a very great variety, but this need not surprise us when we remember the great extent of the confederation of Xibalba, and the very different tribes composing it. The Quichés and the Cakchiquels inhabiting the highlands of Guatemala built their towns, as did the Cliff Dwellers, on points difficult of access, and surrounded them with lofty walls and deep trenches. Grijalva and Cordova, the first Spaniards to visit the coast of Yucatan, speak of houses built of stone cemented with a mortar made of lime, and covered in with roofs of reeds or palm-leaves, sometimes even with slabs of stone.² These houses had door-ways, but no doors, and every one was free to go in and out.

In Nicaragua, the walls, like those of the *jacals* of the Indians, were of cane. The houses of the chiefs were erected on artificial platforms, often several feet high. Cortez tells us³ that the one he lived in, near the Gulf of Dulce, consisted merely of a roof supported on posts. The temples, with one notable exception, were not more impos-

¹ Herrera: "Hist. Gen.," dec. I., book V., ch. V.; Cogolludo: "Hist. de Yucatan," p. 4. At the present day the Haidas, living on the Queen Charlotte Islands, build similar boats capable of holding one hundred people, and are not afraid to undertake long voyages in them.

² Juan de Grijalva: "Cronica de la Ordende N. P. S. Augustin," Mexico, 1624. "Las casas son de piedro y ladrillo, con la cubierta de paja o rama, y dun alguna de lanchas de piedra." Gomara: "Hist. de Mexico," Antwerp, 1554, folio 23. "The houses were of stone or brick and lyme, very artificially composed. To the square courts or first habitations of their houses they ascended by ten or twelve steps. The roof was of reeds or stalks or herbs." "Purchas His Pilgrimes," London, 1625-6.

³ "Cartas," pp. 268, 426, 447.

ing than the houses of the people. The images of the gods were kept in very dark subterranean rooms. Before each temple rose a truncated pyramid, resembling those of Florida or Mississippi. It was there that the sacrifices were offered up in the sight of all the people.¹

We have now summed up all that is really known of the Mayas. The temples and palaces of which the ruins are still standing give a better idea of their artistic taste and social organization; but before commencing their study we must speak of the Nahuas, who overran in their turn these countries whose resources had become celebrated.

As already stated, we must include under the title of Nahuas the tribes, evidently of the same origin, who successively dominated Anahuac.²

The Toltecs³ were the first to establish a regular government, and this government gradually spread to the neighboring countries. These Toltecs arrived about the sixth century of our era; later they were replaced by the Chichimecs, who in their turn were to be vanquished by the combined forces of the Aztecs, Acolhuas, and Tepanecs. Finally the Aztecs, as conquerors of their former allies, remained sole masters of Mexico until the Spanish conquest. Between the sixth and sixteenth centuries then there were three distinct periods in the Nahuatl rule: that of the Toltecs, that of the Chichimecs, and that of the Aztecs. Between these two limits we must place the numerous invasions of the various people who, driven on as by an irre-

¹ Oviedo: "Hist. Gen.," vol. IV., p. 27. Peter Martyr: dec., VI., book V.

² The prefix A in Anahuac appears to be an abbreviation of *Atl*, water. Anahuac may therefore be translated as the country of the Nahuas by the water. It is difficult to fix the extent of this country. It varied greatly at different periods. We think, however, that it was limited on the Atlantic by the 18th and 21st degrees of N. lat., and on the Pacific by the 14th and 19th. Becker: "On the Migrations of the Nahuas"; Cong. des Américanistes, Luxembourg, 1877.

³ The name of Toltecs, which we take for want of a better, is founded on very insufficient data. Sahagun, one of the most ancient Spanish historians, was, we think, the first to use it, in his "Hist. Gen. de las Cosas de Nueva España."

sistible force, precipitated themselves toward this common centre.¹

All these people belonged to one race, all spoke dialects apparently springing from the same source. This point has been hotly disputed. "From a careful examination of the early authorities, I can but entertain the opinion that the Toltec, Chichimec, and Aztec languages are one." These conclusions of Bancroft's (vol. III., p. 724) are also mine.

This is an important point; the identity or the relationship of languages is incontestably an ethnological fact, which establishes the relationship of nations.²

Very little is known of this past; from the time of the destruction of the Xibalba confederation chronological data are most confused, and the history of Central America is shrouded in mystery which can be only very imperfectly penetrated.

The ancient American races preserved the tradition of distinct migrations, in their hieroglyphics and pictographs. According to these traditions it was from a country situated on the north or the northwest that the Nahuas came. This is the version of all Spanish historians, and we may mention amongst them Duran, Veytia, Torquemada, Vetancurt, and Clavigero. Bancroft, however, (vol. V., pp. 219, 616, *et. seq.*) thinks these people came from the south. We are obliged to add that his reasons for this opinion do not appear to us conclusive.

This country called *Huehuetlapallan* in the Popol-Vuh; Tulan-Zuiwa by other historians,³ must be the same as the country of *Amaquemecan*, the birthplace of the Chichimecs.

Ferdinand Alva de Ixtlilxochitl, a Christian descendant of the rulers of the country, has endeavored to trace the ancient history of his race.⁴ It is too easy to recognize in

¹ Bancroft with his usual accuracy enumerates these people. We can but refer the reader to him. "Native Races," vol. II., pp. 103, *et seq.*

² F. von Hellwald: "The American Migrations," "Smith. Cont.," 1866.

³ An attempt has been made to identify Tulan-Zuiwa with the seven caves that play such an important part in Aztec traditions.

⁴ "Relaciones" and "Hist. Chichimeca," Kingsborough: "Ant. of Mex.," vol. IX.

his narrative the religious influence of the Spanish missionaries to accord it any great confidence. According to him seven families were saved from the deluge. After long and arduous journeys their descendants settled in Huchue-Tlapallan, a fertile country and pleasant to live in, adds the historian.¹



FIG. 114.—Quetzacoatl (Ethnographical Department of the Trocadero Museum, Paris).

Their sojourn was long and their fortunes were various; they were at last compelled to leave their adopted country after numerous defeats, and it was then that they went

¹ Bancroft (vol. V., pp. 208-218) gives a summary of the whole of this history, which is legendary rather than serious.

In spite of wars and discord the time of the Toltec domination is enshrined in the memory of the Nahuas as their golden age. The Toltecs, they tell us were tall, well-proportioned, with clear yellow complexions; their eyes



FIG. 115.—Quetzacoatl.

were black, their teeth very white; their hair was black and glossy; their lips were thick; their noses were aquiline, and their foreheads were receding. Their beards were thin, and they had very little hair on their bodies; the expression of

their mouths was sweet, but that of the upper part of their face severe. They were brave, but cruel, eager for revenge, and the religious rights practised by them were sanguinary. Intelligent and ready to learn, they were the first to make roads and aqueducts; they knew how to utilize certain metals; they could spin, weave and dye cloth, cut precious stones, build solid houses of stone cemented with lime mortar, found regular towns, and lastly build mounds which may justly be compared with those of the Mississippi valley.¹ To them popular gratitude attributes the invention of medicine, and the vapor bath (*temascalli*). Certain plants² to which curative properties were attributed were the remedies mostly used. In the towns, we are told, were hospitals where the poor were received and cared for gratuitously.³

Our information respecting the commerce of the Toltecs is very vague. We know, however, that it was important. At certain periods of the year regular fairs were held at Toltan and Cholula; the products of the regions washed by both oceans were seen side by side with numerous objects made by the Toltecs themselves. These objects were of great variety, for though iron was unknown to them the Toltecs worked in gold, silver, copper, tin, and lead.⁴ Their jewelry is celebrated, and the few valuable ornaments which escaped the rapacity of the Conquistadores are still justly admired. The Toltecs cut down trees with copper hatchets, and sculptured bas-reliefs and hieroglyphics with stone implements. For this purpose flint, porphyry, basalt, and above all, obsidian, the *istli* of the Mexicans, were used. Emeralds,⁵ turquoises, amethysts, of which large deposits were found in various places, were sought after for making

¹ Bancroft, vol. I., p. 24.

² "Casi todos sus males curan con yerbas." Gomara: "Hist. de Mexico," Antwerp, 1554, fol. 117.

³ "En las ciudades principales * * * habea hospitales dotadas de rentas y vasallos, donde se resabian y curaban los enfermos pobres." Las Casas: "Hist. Apol." MS. quoted by Bancroft, vol. II., p. 597.

⁴ Ixtlilxochitl: "Relaciones," Kingsborough, vol. IX., p. 332.

⁵ "Gli smeraldi erano tanto comuni, che non v'era signora che non ne avesse." Clavigero: "St. Ant. del Messico," vol. II., pp. 206-7.

jewelry for both men and women. At Cholula a famous kind of pottery was made, including vases and the utensils in daily use, censers, and idols for the temples of the gods and common ornaments for the people.

The weapons of the Toltecs resembled those of the Mayas. Like them, too, they wore garments padded with cotton, forming regular armor impenetrable to arrows and javelins. Their round shields called *chimallis* were made of light and flexible bamboos, and those of their chiefs were ornamented with plaques of gold, insignia of the rank of their owners.

Cremation appears to have been practised very early. It is said that the Nahuas burned the bodies of their chiefs, so as to be able to carry their ashes about with them in their migrations; Ixtlilxochitl speaks of a Chichimec chief being killed in war, whose body was burned on the field of battle.¹ The body of Topiltzin, the last ruler of the Toltec race, was also burned. With the common people, however, burial was the usual mode of disposing of the dead²; such was the purpose of the hundreds of tumuli still in existence near Teotihuacan.³ Amongst the Chichimecs, on the contrary, cremation was the general practice.⁴ Human sacrifices⁵ accompanied funeral ceremonies; women were burned alive upon the funeral pile of their husbands, and they accepted this cruel death with joy, for it opened to them the first celestial sphere, where they could follow their husbands. If they refused to submit to this sacrifice, their future

¹ "Relaciones," *loc. cit.*, pp. 325, 327, 332, 388.

² "La gente menuda comunmente se enterrana," Gomara, *loc. cit.*, fol. 308.

³ Sahagun: "Hist. Gen.," vol. III., book X., p. 141. Ixtlilxochitl, *loc. cit.*, p. 327.

⁴ Torquemada: "Monarquia Indiana," Madrid, 1723, vol. I., pp. 60, 72, 87.

⁵ The victims were generally prisoners of war. At royal funerals were also offered up those who were born in the five complementary days of their year, which were looked upon as of bad omen. Ixtlilxochitl, *loc. cit.*, p. 379 and 388. Veytia: "Hist. Antigua de Mejico," Mexico, 1836, vol. III., pp. 8, *et seq.*

life had to be passed in *Mictlan*, a gloomy and solitary abode.

The Toltecs formed a grand confederation of tribes, under the government of hereditary chiefs. By a somewhat strange condition, of which we know no other example in the history of races, the rulers could only reign for a cycle of years (*Xuikmolpilli*).—This cycle was fixed at fifty-two years, and when this time, which, it must be admitted, was of considerable length, was accomplished, the chief handed over to his successor the power and insignia of office. Another obligation, little in harmony with the customs of the Nahuas, with whom concubinage was legal, was imposed upon the chief: he could not have more than one wife, and if she died before him, he was forbidden to re-marry, and he could not even take a concubine. Second marriage was also forbidden to the wives of rulers.¹

The traditions which have come down to us of the magnificence of the Toltec rulers are interesting, and probably much exaggerated. The palace of Quetzacoatl,² according to these legends, contained four principal rooms: the first opened on the east and was called the Gilded Chamber; its walls were covered with finely chased plaques of gold; an Emerald and Turquoise Room was on the west, and as its name implies, the walls were encrusted with these stones; the walls of the southern room were ornamented with shells of brilliant colors, set in plaques of silver; and lastly, the northern room was of finely wrought red jasper. In another palace, the walls of all the rooms were hidden by tapestries of feathers; in one the feathers were yellow; in another, blue taken from the wings of a bird called *Xeuhtototl*. In the southern room the feathers were white, and in that on the north they were red.³

Side by side with the Toltecs, in the mountainous regions of the north of Mexico, lived numerous savage tribes, in-

¹ Bancroft, vol. II., p. 265.

² We should have remarked that the termination *tl*, so characteristic of the Nahuatl language, is met with again in the Indian dialects of the Pacific coast.

³ Sahagun, "Hist. Gen.," vol. III., book X., p. 107.

cluded under the general name of Chichimecs, of which the more important were the Pames, Otomes, Pintos, Micho-caques, and Tarascos. These people, chiefly of the Nahuatl race, and coming originally from the same district as the Toltecs, were plunged in the most complete barbarism. They despised all culture, and their only occupation was to hunt game in the forests which covered a great part of their territory, even to the summit of the loftiest mountains. No flesh came amiss to them; they ate wolves, pumas, weasels, moles, and mice; failing them, lizards, snakes, grasshoppers and earth-worms.¹

Spanish historians report that in the sixteenth century the Chichimecs wandered about completely naked, or wearing only the skins of beasts, which they flung over their shoulders, with the hair inside in the winter and outside in the summer. Most of them lived in caves, or rock-shelters. Some of them, however, knew how to shelter themselves, either by placing a roof of palm-leaves upon posts sunk in the ground, or by driving trunks of trees into the earth, which were then bound together with creepers. Where wood was scarce, they replaced it with clay, dried in the sun and cut into adobes. Inside these huts hung a few reed mats, which with gourds and very rude pottery made up all their household goods. On this pottery, however, a certain artistic feeling is already discernible, and black figures, executed with taste, often stand out upon a red ground.

Constantly at war with their neighbors, they often undertook raids, and could repulse with energy every attack upon their own territory. Their weapons were bows and arrows, slings, with which they flung little pottery balls, which caused dangerous wounds, and above all, clubs, which were formidable weapons in their hands.²

The warriors wore a bone at their waist, and on this bone, in testimony of their courage, they made a mark for every

¹ Jos. de Acosta, "Hist. Natural y moral de las Yndias." Seville, 1580.

² Ixtlilxochitl: "Hist. Chic.," *I. c.*, p. 214. Gomara: *I. c.*, p. 298. Torquemada: *I. c.*, p. 38.

enemy that they killed. The prisoners were treated with unheard-of cruelty, and perished under the most horrible torture. The conqueror often scalped them on the field of battle, and the bleeding scalp became a glorious trophy. The heads of the victims were carried in triumph round the camps, in the midst of dances and rejoicings celebrating the victory. The horror and terror with which the Toltecs regarded these people can be imagined. They called them barbarians and drinkers of blood, on account of their taste for the blood of their victims, and their habit of eating strips of raw flesh. This reputation survived their defeat, and after the Spanish conquest, Zarfate¹ speaks of them as the greatest homicides, and the greatest thieves in the whole world. The very name of Chichimec, which is said to be derived from *chichi* log, was a grave insult.

Rude though they were, the Chichimecs had a religion. They adored the sun as the supreme god,² and they also worshipped lightning, represented by the god Mixcoatl³ (the Serpent of Clouds), who, like the antique Jupiter, was figured with thunder-bolts in his hands.

Nearly all these independent tribes, always at war with each other, obeyed chiefs selected by themselves. Some, however, acknowledged no authority, and merely elected a warrior to lead them to battle. Still some laws appear to have been observed amongst these wild races: children could not marry without the consent of their parents, and the violation of this rule involved the death of those guilty of it. Marriage was pronounced null if, the day after the wedding, the husband declared his wife not to be a virgin. Herrera, moreover, says that the Chichimecs could only have one wife, though it is true that they repudiated her on the

¹ Reproduced by Alegre, "Hist. de la Campaña de Jesus en Nueva España," Mexico, 1841, vol. I., p. 281.

² Alegre, *l. c.*, vol. I., p. 279.

³ Also called *Ixtac Mixcoatl*, the white nebulous serpent; recent researches point to the conclusion that he was the same as *Taras*, the chief god of the Tarascos; or *Comaxtli*, the god of the Teochichimecs. Brinton, "The Myths of the New World." New York, 1868.

slightest pretext, to replace her by another. These wives were practically slaves; on them fell all the work of the house, the preparation of food, the weaving of cloth, the making of mats and pottery, the felling of trees, and the fetching of the wood and water needed by the whole family. The cares of maternity made no break in their arduous labor; whilst they were engaged in them they merely hung a basket upon a tree, in which they put their children, whom they often suckled till they were six or seven years old.

Such is the picture given to us by historians of the barbarians who were to conquer the Toltecs. What seems still more difficult to believe, is that the conquerors at once adopted the manners, customs, and social status of the conquered, and the Chichimec supremacy was nothing more than a continuation of the Toltec. Must we then admit that, toward the end of the eleventh century or the beginning of the twelfth, after unknown revolutions and struggles, these savage tribes obtained the supremacy, and in their turn dominated Central America? Is it not more natural to conclude that there is some confusion in the account of the Spanish chroniclers, the sole sources of our information? This confusion may be thus explained. The name of Chichimec was given alike to the barbarous tribes of the north and to the chiefs of Tezcuco. It might then have been these latter, allied perhaps with a few wilder tribes, who were the true conquerors of the Toltecs.

The culture of the Tezcuans was no less advanced than that of the nation they were destined to reduce to submission. The chiefs of Tezcuco are reported to have been as magnificent as those of the Toltecs. Ixtlilxochitl¹ gives an undoubtedly exaggerated account of the palaces, gardens, and lakes, made at great cost, and of the management of the forests preserved for hunting, which may be ascribed to a natural desire to magnify the importance of his race in a manner which would compel the admir-

¹ "Hist. Chichimeca." Kingsborough, "Ant. of Mex.," vol. IX., p. 251.

ation of its conquerors, accustomed as the latter were to kings and courts belonging to a totally distinct stage of culture. He has pretended to enumerate the names of towns which had to supply the service of the ruling chief. Twenty-eight amongst them had to furnish men to take care of the palace; five others, the servants immediately attached to the person of the chief; whilst eight provinces sent gardeners, foresters and laborers. Tezcuco was built on the eastern bank of the Lake of Mexico; the waters are dried up, and the modern town is several miles off. But few traces remain of its alleged grandeur. Mayer speaks of substructures of adobes, covering squares of 400 feet. They are supposed to be the foundations of ancient pyramids; bits of pottery, numerous idols, chips of obsidian, and other rubbish, have been picked up all about them.

The power of the Chichimec chief who invaded the country of the Toltecs is still further illustrated, if we attach importance to such evidence as we have cited, by the number of those who followed him in this expedition. According to the historian quoted above (pp. 337-375), Xolotl had under his orders 3,202,000 men and women, and he is careful to add that he does not include amongst them the children who accompanied their mothers. The absurdity of this is obvious. Torquemada,¹ though he confesses that this account may appear exaggerated, relates that the historic paintings which are relied on to attest these facts, are supposed to enumerate a million warriors, under the order of six grand chiefs and twenty thousand or even twenty-two thousand chiefs of inferior rank. Nothing can be more obscure than the date of this invasion. Veytia ("Hist. Ant. Mej.," vol. II., p. 7) fixes the Chichimec victory in 1117; Ixtlilxochitl seems to confuse the facts, or at least he assigns to them several different dates, varying from 962 to 1015 ("Ant. of Mex.," vol. IX., pp. 208, 337, 395, 451). Clavigero speaks of 1170. Other historians will have it that the fall of the Toltec league preceded the Chichimec invasion.

¹ "Monarquía Indiana," vol. I., p. 44.

They differ as much about the facts as about the dates. In truth the evidence throughout is more legendary than historical.

The Toltecs, enervated by luxury, pleasure, and the most shameful debauchery, decimated by pestilential maladies, abandoned by the allies they had oppressed and by their own subjects, who in consequence of a religious schism had emigrated in great numbers to more favored regions, yet gave proof, in this supreme danger, of manly energy. Their chief Acxtitl called all his subjects to arms; the old men and children took weapons in hand; Xochitl, mother of the chief, is said to have been killed fighting valiantly at the head of a legion of Amazons. But these efforts came too late; the Toltecs were completely defeated and nearly exterminated, after repeated conflicts lasting several days.¹ Tolan their capital was taken; the country submitted; and Xolotl took the title of *Chichimecatl Tecuhtli*, the great chief of the Chichimecs. His descendants added to this pompous title that of *Huactlatohani*, lord of the world.

To confirm his power, he divided the country into several provinces, which he gave in fief to his principal officers on condition of their subordination to him; and by a skilful policy he planned that his eldest son Nopaltzin should marry a daughter of the Toltec ruling family.²

It is not our intention to narrate the supposed history of the Chichimecs. We may mention among the Chichimec chiefs who succeeded Xolotl, his son Nopaltzin, Tlotzin, Pochotl, who ruled from 1305 to 1359, Ixtlilxochitl, who died about 1419, Tezozomoc, who usurped the power of the son of Ixtlilxochitl, and reigned eight years, and lastly Maxtla, who possessed himself of the chieftainship by the murder of his eldest brother.³ Their history is the relation of a succession of revolts, bloody wars, conspiracies, and

¹ We follow the account given by Ixtlilxochitl; that of Veytia, "Hist. Ant. Mej," vol. I., p. 302-3) presents notable differences; so does that of Brasseur de Bourbourg ("Hist. des. Nat. Civ.," vol. I., p. 405, etc.).

² Brasseur de Bourbourg, quoted above, vol. I., p. 236.

³ See Bancroft, *l. c.*, vol. V., chs. V., VI., and VII.

revolutions, which was to end in 1431 in the triple alliance of the Aztecs, Acolhuas, and Tepanecs, and then in the ephemeral triumph of the Aztecs as conquerors of all their rivals.

The Tepanecs and the Acolhuas had been the faithful allies of Xolotl in his struggles with the Toltecs, and their chiefs took a subordinate place in the new league. They had long been established in Anahuac when the Aztecs arrived there. Both had probably formed part of some of the numerous immigrations which succeeded each other in Central America.¹ All these men came from a country to which the unanimous accounts of the chroniclers give the name of Aztlan. Where was this land, this *officina gentium*, which throughout more than five centuries sent southward whole nations, all speaking the same language; practising the same rights; accepting the same cosmogony; all under the rule of sacerdotal orders strictly supervised by priests; with the same divisions of time, the same hieroglyphical paintings, the same taste for noting and registering events; and who understood each other without difficulty, recognizing their common origin? There are few points more obscure and more hotly contested than the situation of Aztlan. It has been sought in turn in California, Mississippi, New Mexico, Florida, Zacatecas, and in yet other regions. All these hypotheses have been brought forward, and there is something to be said for them all. The importance of the question is assuredly considerable, for, if there be a connection between the Nahuas and the Northern Indians, it is to Aztlan that we must look for it.²

¹ Bancroft, *loc. cit.* vol. V., p. 305. F. von Hellwald: "The American Migrations," Smith. Contr., 1866.

² Brasseur de Bourbourg ("Hist. des Nat. Civilisées," vol. II., p. 292) places Aztlan in California; Humboldt ("Researches concerning the institutions and monuments of the ancient inhabitants of America," translated by Helen Maria Williams, 1814), about 42° north latitude. Foster: "Preh. Races," p. 340. Vetancurt ("Teatro Mexicano," part II., p. 20) speaks of New Mexico. Fontaine ("How the World was Peopled," p. 149) looks upon the earthworks of Mississippi as witnesses to Aztec migrations. Pritchard ("Nat. Hist. of Man," vol. II., pp. 514-5) sees in the Moquis the last descendants of the Aztecs. Bandelier says, in speaking of *Chicomoztoc* (the

The Aztecs had left Aztlan at the same time as the people who had preceded them in Anahuac; but according to tradition they halted for a long time at Chicomoztoc.¹ It was not therefore until much later, between 1186 and 1194,² if we adopt the date given by the Codex Chimalpopoca, that they established themselves at Chapultepec. Their early settlement was full of difficulties; overcome by their neighbors, with whom they were perpetually at war, they were forced to leave the country where they had established themselves, and compelled to take refuge in the midst of almost inaccessible marshes, dotted here and there by a few wretched islets of sand. It was on one of these islets that they founded Tenochtitlan, or Mexico.³ Hunting and fishing could not long supply the needs of a population which rapidly increased. By dint of hard work the Aztecs managed to make gardens in the water in which grew maize and other plants.⁴ Then, the water of the lake being

seven caves): "These caves are in Aztlan, a country which we all know to be toward the north and connected with Florida." "Report, Peabody Museum," vol. II., p. 95, etc.). Clavigero ("St. Ant. del Messico," vol. I., p. 156) mentions the Colorado as the stream that all accounts say was crossed by the emigrants; whilst Boturini ("Idea de una nueva hist. general de la America Septentrional" pp. 126-8) has it that the Gulf of California is referred to. Lastly Bancroft (quoted above, vol. V., p. 322), who believes Aztlan to have been in the south near Anahuac, concludes thus: "We have no means of determining, in a manner at all satisfactory, whether Aztlan and Chicomoztoc were in Central America or in Zacatecas and Jalisco; nor indeed of proving that they were not in Alaska, in New Mexico, or on the Mississippi," a remark with which we heartily concur.

¹ Bancroft gives the whole of the march of the Aztecs. Chicomoztoc is supposed to be the seven caves celebrated in all legends. Generally, Chicomoztoc is placed in the same place as Aztlan.

² In 1140 or in 1189, according to two different dates given by Ixtlilxochitl; in 1245, according to Clavigero; in 1298, according to Veytia, Gama, and Galatin; in 1331, according to Gondra. The margin as we see is wide. The Codex Chimalpopoca is dated May 22, 1538. Bancroft may be consulted (*l. c.*, vol. V., p. 192), who gives interesting details bearing upon the question.

³ This settlement took place about 1325. Duran cited by Bancroft (*l. c.*, vol. I., chap. IV-VI.; Veytia: "Hist. Ant. de Méjico," vol. II., p. 156; Torquemada: "Mon. Ind.," vol. I., p. 92, 288, *et seq.*; Ixtlilxochitl: *l. c.*, vol. IX., p. 461; F. de Alvarado Tezozomoc, "Chron. Mexicana," Kingsborough, vol. IX.

⁴ Bandelier: "Report, Peabody Museum," vol. II., p. 403. These gardens

brackish, they obtained, by paying an annual tribute, the right of fetching from the shore the fresh water which was needed in their homes.

Such was the humble beginning of the Aztecs; but their subsequent history is even more confused than that of the people of whom we have been speaking. One of the causes of this confusion was the constant rivalry between the two regions of Tenochtitlan and Tezcuco, and the want of care taken by the first Spanish chroniclers in distinguishing between the facts relating to each of the two countries.

It seems that as we approach the end of this bloody era tradition itself is effaced. As under the Chichimec domination we find whole series of wars and revolts, of struggles and submissions. Brasseur de Bourbourg (*l. c.*, vol. III., p. 194, *et seq.*) gives a full account of them. Unfortunately he is inexact on a multitude of points. The chief wars carried on by the Aztecs were against the kingdom of Michoacan, inhabited by the Tarascos, a branch of the Toltecs, on the west; and against the Miztecs and Zapotecs on the south. In the midst of this tumult the power of the Aztecs was ever on the increase. Their alliance with the Acolhuas and the Tepanecs, against Maxtla, the last Chichimec chief, ending with his defeat, inaugurated a new era in their history. After the victory a confederation was formed between the conquerors. Nezahualcoyotl, son of Ixtlilxochitl, from whom Tezozomoc had usurped the chieftainship, in his turn took the title of *Chichimecatl Tecuhtli*. Tezcuco was his capital; that of the Tepanecs was Tlacolpan; and that of the Aztecs, as we have seen, Tenochtitlan.

From this moment the Aztecs progressed rapidly; from the marshes where they had found a refuge after their first disasters, their power spread to the shores of the two oceans. Their conquests were won by their victorious arms alone; no town voluntarily accepted their yoke; no nation sought their alliances. The people, were harshly oppressed by their

have been termed "floating" but they were probably merely soft and swampy islets.

foreign conquerors and loaded with odious taxes. Tribute was paid in kind, and consisted of cereals, cotton garments, pipes, rushes, aromatic spices, and various other articles. Some towns of the Pacific were compelled to send annually 4,000 bunches of feathers, 200 sacks of cacao, forty wild-cat skins, and 160 birds of a rare species. The Zapotecs were mulcted to the extent of forty sheets of gold, of a fixed weight, and twenty sacks of cochineal. Certain nomad tribes had to contribute jars filled with gold dust. The towns of the Gulf of Mexico sent 20,000 bunches of feathers, six emerald necklaces, twenty rings of amber or gold, and 16,000 packages of gum. All had to contribute to the tribute, and those who were too wretched to do so were obliged to furnish a certain number of serpents or scorpions. It is alleged that Alonso de Ojeda and Alonso de Mata, mentioned among the companions of Cortes, as the first to enter the so-called royal palace of Mexico, noticed some carefully piled up sacks. They hastened to take possession of them, hoping for a rich booty. These bags were filled with lice, and were part of the tribute of a province. Torquemada (*loc. cit.*, vol. i., p. 461), who is responsible for this extraordinary statement, adds: "Ai quien diga, que non eran Piojos sino Gusaniillos; pero Alonso de Ojeda en sus memoriales lo certifica de vista, y lo mismo Alonso de Mata."¹ The conquered people, pillaged and oppressed by Mexican traders, who were very expert in this kind of traffic, were constantly in revolt. Every fresh rising was quenched in blood, and thousands of human victims perished on the altars of Mexico in honor of the victories. In reading these details, we understand the hatred of the vanquished, and the devotion manifested by the allies of Cortes.²

Mexico, the first houses of which had been a few miserable reed or earth huts, grew with the power of its inhabitants, and soon became a town worthy of the dominion of which

¹ Tezozomoc may also be consulted. "Cron. Mex.," Kingsborough, vol. IX. Clavigero: "St. Ant. del Messico," vol. I. p. 275. Bancroft, *l. c.* vol. II. p. 233 and 234.

² Bancroft, *l. c.*, vol. V., p. 481.

it was the capital.¹ On every side rose the buildings of the rulers, and temples of the native or foreign gods²; for as in ancient Rome, the divinities of the conquered people became those of the conquerors. Nor were more useful works wanting. Viaducts, supplemented by large bridges constructed on scientific principles, were erected by the tributary or allied tribes, rendering communication easy.³ A dyke seven or eight miles long, and, according to different accounts, thirty to sixty feet wide, was intended to protect the city of Mexico against inundations.⁴ The inhabitants were supplied with water by means of aqueducts, and as early as 1446, this water was conducted from Chapultepec to the capital through earthenware pipes.

The prosperity of Tezcuco was not inferior to that of Mexico, and the figures of two of its rulers stand out to relieve the monotony of the history of Anahuac. Thanks to the wise administration of Nezahualcoyotl, Tezcuco had become the centre of the art and culture of that people.⁵ The chief himself was a distinguished poet. Ixtlilxochitl, his descendant in the direct line, has preserved some of his poems,⁶ which were still famous at the time of the conquest.

¹ The Mexican chiefs previous to the Spanish conquest were Itzcoatl who died, 1440; Montezuma I. to 1469; Axayacatl to 1481; Tizoc to 1486; Ahuizotl to 1503; Montezuma II. to 1520.

² Torquemada alleges that there were more than forty thousand temples or *teocallis* in Mexico.

³ "Hay sus puentes de muy anchas, y muy grandes vigas juntas y recias y bien labradas, y tales que por muchas dellas pueden passar diez de caballo juntos a la par." Cortes: "Cartas," p. 203.

⁴ Veytia, vol. III., p. 247. Torquemada, vol. I., p. 157. Clavigero, vol. I., p. 233. Brasseur de Bourbourg, vol. III., p. 228.

⁵ Sagahun describes the education given to the sons and daughters of the chief. He mentions a discourse addressed by Nezahualcoyotl to his children, remarkable for the elevated sentiments displayed in it.

⁶ Four odes are given in Lord Kingsborough's collection (vol. VIII., pp. 110-115). One is an imprecation against Tezozomoc, who had usurped the throne of Nezahualcoyotl's ancestors; another is the ode on the vicissitudes of life, from which the above quotation is taken; the third, recited at a banquet, is a comparison between the chiefs of Anahuac and precious stones. Lastly, the fourth, celebrates the dedication of a royal palace, and enlarges upon the perishable nature of earthly grandeur. Bancroft, (vol. II., p. 494) gives an Eng-

We will only quote one strophe, from an ode on the vicissitudes of life, in which the chief, speaking of himself, writes: "No, thou shalt not be forgotten; no, the good which thou hast done shall not be lost unto men; for is not the throne which thou occupiest the gift of the matchless God, the powerful creator of all things, who makes and who brings down chiefs and rulers?" We may add that the succeeding strophes express similar sentiments, which it seems strange to find in a man in the state of culture of the Mexicans; they breathe disdain of that pomp of which the chief had learned to feel the vanity; if they are genuine, they would justify to a certain degree the assertion of the Spanish historian, who tells us that Nezahualcoyotl worshipped one invisible god, the appearance of whom it was impossible for mortal to conceive.

Nezahualcoyotl died about 1472; he left only one legitimate son, but more than a hundred children by his concubines; that son—Nezahuapilli—succeeded him; he proved himself, like his father, skilful in war, just, always severe, often inexorable, merciful toward the weak, generous toward his subjects. Like his father, he was addicted to pleasure, and he is said to have had in his palace more than two thousand concubines. He had also several legitimate wives. The daughter of Axacayatl, of whom we shall speak, was among the number, as were three nieces of Tizoc.

Among his wives was a daughter of Axacayatl, ruler of Mexico; she was very young, and a private palace had been assigned to her until the time when the marriage should be consummated. She was noted for her beauty, and the king paid her frequent visits; each time he noticed, in a room where he was, a great number of statues covered with rich robes; but, not wishing to thwart his wife in her tastes, he made no remark upon them. One day he saw the queen's ring on the finger of one of his principal courtiers. His suspicions were awakened, and the same evening he paid a visit

lish translation of two of these odes. F. W. v. Müller ("Reisen in den Vereinigten Staten, Canada, und Mexico," Leipzig, 1864, vol. III., pp. 128-141) republishes two other odes previously unknown.

to the palace of Chalchiuhuetzin. The queen, according to the asseverations of her attendants, was asleep. Nezahualpilli went into her room; a lay figure, dressed in the queen's clothes, occupied her place in the royal bed. The king, whose suspicions were justly confirmed, pursued his researches, and in a secret part of the palace he saw his young wife, completely naked, dancing with three of his principal officers. The statues were those of her lovers, and by a strange whim she had had them represented in the costume which they had worn the first time they had enjoyed her favors. The punishment was terrible; notwithstanding the respect due to her rank, she was strangled; and with her perished her lovers, the women in her service, and more than two thousand persons convicted of complicity, or of even the slightest knowledge of her licentiousness.¹

This is not the only example of severity which legend narrates of Nezahualpilli. His eldest son had shown remarkable talents as a general. He was the favorite of the chief, who conferred upon him the title of *Tlatecatl*, the greatest honor which a Tezcuan could receive. One day he was accused of having spoken too freely to one of his father's concubines. The chief examined the guilty persons, and the fact being proved, he did not hesitate to put into practice a law which he had made; he condemned his son to death, and caused him to be executed in spite of the supplications of his courtiers.² Another of his sons had begun the building of a palace, without having obtained authority for so doing, or having distinguished himself in war by any of those actions which alone gave the right to possess a separate palace; the chief caused him also to be executed. Some years afterward, Tezozomoc, father-in-law of Montezuma, was accused of adultery; the judges, out of regard for his rank, had only condemned him to banishment. Neza-

¹ Torquemada, vol. I., p. 184. Ixtlilxochitl: "Hist. Chichemec," *loc. cit.*, pp. 265, 267, 271.

² Torquemada: "Mon. Ind.," vol. I., p. 165.

hualpilli ordered him to be strangled, thereby greatly irritating the chiefs who were his allies.

The last years of the life of the ruler of Tezcuco were sad. A prophecy, in which the Tezcuan placed great confidence, gave out that the god Quetzacoatl was to return to the earth, in the same form as at his first appearance. The date, fixed by this prophecy, arrived, and coincided with the disembarkation of the Spaniards. The superstitious mind of the chief was singularly impressed by this fact. From that time he shut himself up in his house, occupied himself no more with public affairs, and even refused to receive those to whom he had entrusted the management of affairs. His death, now supposed to have been in 1515, was long unknown, and a legend which grew up round his name has been perpetuated to the present day; the Tezcuan imagined that death could not touch him, and that he had retired to Amaquemecan, the land of his ancestors.¹

The death of Nezahualpilli, and the quarrels which arose between his sons, promoted the ambitious schemes of Montezuma. He was for a short time undisputed master of Anahuac, but fortune soon abandoned him; he knew neither how to fight the Spanish, to treat with them, or to ensure the devotion of his own people. The empire of the Aztecs was doomed, and Anahuac, like the whole of the New World, was to belong to other races, for whom by unfathomable decrees the future of America was reserved.

So far as we can judge at the present day, religious ideas were met with amongst all the American races, but with the most striking contrasts. Some tribes had not got beyond fetichism, the most degraded and primitive form of worship. Idolatry, which prevailed amongst the nations of Central America, was a higher form; the savage adored the waves of the sea, the trees of the forest, the waters of the spring, the stars of the firmament, the stones beneath his

¹ Torquemada, vol. I., p. 216. Ixtlilxochitl: "Hist. Chic.," pp. 282, 388, 410. Tezozomoc, Kingsborough, vol. IX., p. 178. Fray Diego Duran places his death in 1509, "Hist. de las Indias de la Nueva España," written between 1567 and 1581, and published at Mexico by D. Ramirez in 1867.

feet ; he invested with supernatural power the first object to strike his eyes or impress his imagination. The idolater is superior to the fetich worshipper ; he adores the god of the sun, of the sea, of the forest, of the spring ; he often clothes this god, before whom he trembles, with a human form (figs. 114, 115, 116), and attributes to him the passions of his own heart. Monotheism, from a purely philosophical point of view, is a great advance. It has been said that the Aztecs adored an invisible god, Teotl, the supreme master, but this



FIG. 116.—Idol in terra-cotta.

fact is disputed, and every thing goes to prove on the contrary that polytheism existed amongst them, and a very inferior polytheism, too, to that, for instance, which history records among the Egyptians or the Greeks.¹ The number of secondary divinities was very considerable ; every tribe, every family, every profession had its patrons, and thought to do honor to its gods by severe fasts, prolonged chastity, bathspurifications, and often also cruel mortifications.

¹ " Their mythology, as far as we know it, presents a great number of unconnected gods, without apparent system or unity of design." Gallatin, " *Am. Ant. Soc. Trans.*," vol. I., p. 352.

Before celebrating the feast of the god Camaxtli, for instance, the priests were bound to rigorously abstain from indulgence for a period of a hundred and sixty days; and during that time they pierced their tongues with little pointed sticks having about the diameter of a quill.

Among all the tribes of the Nahuatl race religious holidays were frequent, each of them being accompanied by human sacrifices. On such occasions, in accordance with a strictly observed rite, infants at the breast were offered to the god of rain; these infants were sacrificed on high mountains, or thrown into the lake which washes the city of



FIG. 117.—Obsidian knife used by the sacrificing priests (Trocadero Museum).

Mexico. In the following month sacrifices no less bloody were required by the god of the goldsmiths. Hundreds of miserable captives were successively led to the chief priest; the breast was cut open with an obsidian knife (figs. 117, 118); the heart was torn out and offered, still palpitating, to the idol. At other festivals, if they can be so called, the skin of the unfortunate sufferer was stripped off; gladiators clothed themselves in it for mock combats; or in an outbreak of zeal priests prided themselves in wearing the spoils (figs. 119 and 120) until the skins fell into rags. "They smelt like dead dogs," adds Sahagun, from whom we take this detail.

The hideous trophy was then hung up in the temple of Yapico, or, if it had belonged to a prisoner taken in war, returned to the offerer of the victim. The rejoicings in honor of Mixcoatl, the god¹ of hunting and thunder, were inaugurated by battues, in which animals—such as deer, coyotes, hares, rabbits—fell beneath the arrows of the devotees. Then came the inevitable human sacrifices; a



FIG. 118.—Sacrificial collar (Trocadero Museum).

great fire was lighted, into which the men threw pipes or vases (fig. 121), the women distaffs, in the hope that the god would repay their offerings with interest in the life awaiting them beyond the grave.²

¹ Perhaps we should say the goddess; this point has been very much disputed.

² Bancroft (vol. II., chap. IX., and vol. III., pp. 355-412) gives a very exact account of these celebrations, to which we refer those who wish to know more about them.

On the day consecrated to Xuihtecutli, the god of fire, the captives were carried in triumph, on the shoulders of the priests, to the platform from which the teocalli rose, and then flung into a red-hot furnace. From every side crowds gathered to gloat over the agony of the unfortunate wretches; and dances, rejoicings, and feasts in which human flesh was the chief dainty, ended the day. The most delicate morsels were reserved for the priests. Part of the body was given



FIG. 119.—Mexican carving representing an Aztec priest clothed in a human skin.

back to the person furnishing the victim. Sahagun tells us that this meat was cooked with hominy. The dish was called *Tlacatlaotli*, and the master of the slave sacrificed was not allowed to eat it, for the slave was looked upon as one of the family.

At Tlascala, one month of the year was dedicated to sensual pleasures. It was inaugurated by the sacrifice of numerous virgins. At other times, a young man and a young girl, chosen on account of their beauty, were maintained for

a whole year in royal luxury, and then led to the sacrifice as victims acceptable to the gods.

Such were the religious rites which were observed every year. There were also extraordinary rites, on the occasion of victory, the accession of a ruler, or the dedication of a temple. The last event was frequent in Mexico, and also



FIG. 120.—Vase used in sacrifices, the head representing that of a priest covered with human skin. From the Trocadero Museum.

the occasion for a sacrifice of hecatombs of victims. If the Aztecs were visited by a defeat, a pestilential malady, a famine, or an earthquake, the people eagerly offered fresh sacrifices to appease the anger of the gods. The dedication by Ahuizotl of the great temple of Huitzilopochtli,¹ in 1487,

¹ Bancroft's text is as follows: "Native Races," vol. III., p. 288, 289.
 "Huitzilopochtli, Huitziloputzli, or Vitziliputzili, was the god of war, and the

is alleged to have been celebrated by the butchery of 72,344 victims;¹ the priests were wearied with striking, and had to be successively replaced; but the people did not tire of the frightful butchery; they responded by exclamations of joy to the groans of the dying.² Under Montezuma II., twelve thousand captives are said to have perished at the inauguration of a mysterious stone, brought to Mexico at great expense, and destined to form the sacrificial altar,³ but fortu-

especially national god of the Mexicans. Some said that he was a purely spiritual being, others that a woman had borne him after miraculous conception. This legend, following Clavigero, ran as follows: In the ancient city of Tula lived a most devout woman, Coatlicue by name. Walking one day in the temple, as her custom was, she saw a little ball of feathers floating down from heaven, which, taking without thought, she put into her bosom. The walk being ended, however, she could not find the ball, and wondered much, all the more that soon after this she found herself pregnant. She had already many children, who now, to avert this dishonor of their house, conspired to kill her; at which she was sorely troubled. But, from the midst of her womb the god spoke: 'Fear not, O my mother, for this danger will I turn to our great honor and glory.' And lo, Huitzilopochtli, perfect as Pallas Athena, was instantly born, springing up with a mighty war shout, grasping the shield and the glittering spear. His left leg and his head were adorned with plumes of green; his face, arms, and thighs barred terribly with lines of blue. He fell upon the unnatural children, slew them all, and endowed his mother with their spoils. And from that day forth his names were Tezahuil, Terror, and Tetzauhteotl, Terrible God."

¹ Recent researches justify us in believing that the number of the victims has been greatly exaggerated by the Spanish historians. Admitting this exaggeration, which seems to us necessary, it is probable that only in the interior of Africa could such wholesale slaughter as really occurred in Mexico be paralleled.

² Torquemada, vol. I., p. 186. Vetancurt: "Teatro Mex.," vol. II., p. 37.

³ Sacrificial altars may be classed under three different types: (1) the *Tehcatl*, generally of obsidian or serpentine, and of convex form, so that the breast of the victim is placed in such a position as to facilitate the task of the sacrificing priest. "The height of the altar," says Duran ("Hist. de las Yndias de Nueva España"), reached to a man's waist, and its length might be eight feet. (2) the *Temalacatl*, a stone of cylindrical form, to which was bound the poor wretch, who had to show his courage by defending himself from his assailants with the help of nothing but a shield. As soon as an arrow struck him, he was taken to the *Tehcatl* and his heart at once plucked out by the sacrificing priest. (3) the *Cuauhxicalli*, a concave stone with a basin in the centre, in which the blood was collected. It is to this last type that belongs the celebrated stone discovered in Mexico in 1791. "Ann. del Museo Nacional," Mexico, 1877 and 1878.

nately the end of these sacrifices was approaching; in 1518, when Juan de Grijalva was disembarking on the coast, where Vera Cruz now stands, numerous prisoners were being immolated in honor of the dedication of the Temple of Coatlan.¹ This was the last of these horrible scenes; the Spanish conquerors at once abolished them.

In addition to the extraordinary sacrifices which we have described, the alleged number of victims who perished at the annual saturnalia passes all belief. Zumarraga, the first bishop of Mexico, in a letter dated June 12, 1531, estimates

it at no less than twenty thousand; and Gomara² brings it up even to fifty thousand. These numbers, which are contradicted by Las Casas, in his celebrated treatise,³ are without doubt most grossly exaggerated; but certain facts remain undeniable, which show that the Aztecs had remained sanguinary and barbarous in spite of their apparent culture.



FIG. 121.—Vase found in the island of Los Sacrificios.

The hope or expectation of a life beyond the tomb exists amongst all human races. Man, however degraded he is supposed to be, shrinks from the thought of complete annihilation, and aspires to a happier life than that he is leading. Before the introduction of Christianity, the conception of this life was one of purely material happiness, which varied according to the degree of culture. The Greeks dreamt of purer joys in Elysium than the sensual Mussulman in the arms of his houris, or the Scandinavian Viking in the midst of perpetual feasts. With the savage the idea of a future life is weak; his notions of the past and of the future are so

¹ Torquemada, *l. c.*, vol. I., p. 186. Vetancurt, *l. c.*, vol. II., p. 46. Veytia:

"Hist. Ant. de Mejico," vol. III., p. 476.

² "Hist. Gen. de las Indias." Anvers, 1554.

³ "Hist. Apol. de las Indias Occidentales," Kingsborough, vol. VIII.

confused and vague that it is difficult to make out his real impressions.

Of one thing we may feel certain, that in America, as among the nations of the Old World, these notions varied in different tribes. Some of those of the Pacific included the idea of retribution in the future life; others believed that man was born anew from his ashes, to pass again through the same phases which he had already traversed, but the remembrance of which was forever effaced from his mind. In many places we meet with the idea of transmigration. The Tlascalas of the Nahuatl race were convinced that the social hierarchy would be perpetuated beyond the tomb, the common people being transformed into insects, the chiefs into birds. The ideas of the Aztecs were loftier; they admitted a series of gradations in the happiness reserved for men. Warriors slain in battle were immediately to inhabit the house of the sun; more obscure folk would have less brilliant homes in the various stars peopling the firmament. It seems, however, that this was but a transitional state, a limbo where the dead waited before arriving at their final destination. It lasted four years, and throughout that time the parents and friends were bound to offer meat, wines, flowers, and perfumes to the dead, and to do honor to his memory by feasts and dances.¹ These rites were observed in the two months of *Tlaxochimalco* and *Xocotlhuezin*. The first was sacred to children, the second to chiefs and warriors killed in battle.

The same ideas are met with in all tribes of Nahuatl origin, and are naturally reflected in the ceremonies observed in obsequies. Amongst the Aztecs, when a chief died, the body was covered with mantles richly embroidered and decked with precious stones. While one of the attendants was dressing the body others were cutting up bits of paper, taking care to give to each one a particular form, and placing them on the body. A priest poured water upon the head of the deceased, repeating the words sacred to the

¹ Bancroft, *l. c.*, vol. II., page 618.

funeral rite¹; after which he presented the corpse with various papers. "With this," he said to him, "thou wilt be admitted to cross the defile between the two mountains; with this other, thou wilt avoid the great serpent; with this third, thou wilt put to flight the alligator; with this fourth, thou wilt successfully cross the eight great deserts and the eight hills." The mantles were intended to protect the dead from the winds, as cutting as obsidian, which he would meet with by the way. A little red-haired dog was then killed; a leash of cotton was put round his neck, and he was buried near the deceased. This little dog had the important duty of guiding his master and helping him to cross the *Chicunahuapan*, or nine torrents; it is not difficult to see in this an allusion to the nine firmaments in which souls were to sojourn during their successive migrations.²

Slaves and concubines were generally immolated at the funeral of a chief; their duty was to serve him during the formidable passage from one firmament to another. At the obsequies of the Chichimec rulers, the guardian of the domestic idols was the first victim sacrificed. Amongst the Miztecs, who inhabited the present province of Oajaca, two male slaves and three women were sacrificed, who had previously been stupefied by narcotic drinks. The bodies were deposited in the heart of a forest, and, when possible, in the recesses of a cave.

Burgoa, writing two centuries ago,³ speaks of having seen several of these burying-places. Numerous skeletons covered with trinkets, and gold or silver ornaments, lay in niches hewn out of the walls of the cave. Here and there smaller niches were reserved to the guardian gods of the dead, and their statues were still in existence at the time of the explorations of Burgoa. Quite recently, in the Rio Nayas valley, in the province of Durango, a cave of considerable

¹ Brasseur de Bourbourg, "Hist. des Nat. Civilisées," vol. III., p. 569.

² Torquemada: "Mon. Ind.," vol. II., p. 527. Clavigero: "St. Ant. del Mexico," vol. II., p. 94.

³ "Geografica descripcion de la parte septentrional del Polo Artico de la America." Oajaca, Mexico, 1674, 2 vols.

extent, has been discovered in which thousands of mummies, not resembling the Indians of the present day, slept their last sleep. Each mummy was covered with a mantle of richly-dyed agave leaves. The bodies were in a remarkable state of preservation; the flesh was unshrivelled, and the hair was silky. No metal object was discovered in the researches made which is the only indication we have of the antiquity of this sepulchre.¹

In other cases costly monuments were dedicated to the dead. It was thus with the great pyramid of Mexico, destroyed by the Spaniards, which was said to have been erected to receive the bodies of the chiefs. What is more certain is, that the Conquistadores found treasures in it.

For the common people the funeral ceremonies were necessarily more simple; the rite was, however, always faithfully followed. The body, washed three times with aromatic waters, was successively dressed in ordinary clothes, bright red clothes and feathers, and black clothes and feathers. A stone (*tentell*), of which we do not know the meaning, was placed between the lips of the dead. Papers, regular passports for the other life, were placed by him with liturgical words. By his side was deposited a jar filled with water, a dog—a companion indispensable to the safety of the journey,—the weapons or implements used in life; a hatchet for a soldier, a spade for a laborer, a spindle or a broom for a woman. The corpse was then covered with a mantle symbolical of the patron of the commune to which the deceased had belonged, or even, if we can trust the Spanish writers, of the god of the vices the deceased had indulged in during life, or of the mode of the death which he had met.² Thus the soldier was dressed in the mantle appropriate to the god of war; the merchant in that of the god of commerce; the drunkard in that of the god of wine;

¹ "Proc. Anthr. Soc. of Washington," 1879-1880.

² Gomara: "Hist. Ant. de Mexico," fol. 309. "Vestivano lo d'un abito corrispondente alla sua condizione, alle sue facoltà ed alle circostanze della sua morte," Clavigero, *loc. cit.*, vol. II., p. 39.

the drowned, in that of the presiding gods of the flood; the adulterer, in the mantle consecrated to the god of sensual pleasures,—and when all was thus prepared, the parents and friends brought their offerings. These offerings consisted of flowers, food, clothing, or implements, which had to be renewed several days in succession. The dominant idea of these rites was the desire of assuring to the deceased an existence resembling that which he had had on earth. He was finally borne to his last resting-place, a cave, or to a yet more simple grave dug in the ground.

It would be difficult to give even a rapid summary of the funeral customs observed in regions of so vast an extent; these customs varied in every nation, in every tribe. Some of the Chichimecs, after burying their dead, gave themselves up to dances and feasts, which often lasted many days.¹ Near Tabasco, Grijalva discovered the skeletons of a young boy and a young girl, wrapped in cotton cloths and covered with trinkets. These bodies had merely been laid in the sand of the shore.² At Yucatan the dead were embalmed, the priests taking out the entrails, and placing them in large amphoræ, ornamented sometimes with human and sometimes with animals' heads. In Cozacacoalco, to give only one example, bones stripped of their flesh were put in a basket and placed on the top of a tree near the former home of the deceased, doubtless so that he might be able to find these bones more easily in his successive migrations.³

Cremation dates from the time of the ancient nomad tribes, who could by this means more easily carry about the remains of their ancestors. The custom lasted for many centuries, and, at the arrival of the Conquistadores, it was still in certain places an honor rendered to chiefs and men of note. Brasseur de Bourbourg, says that cremation was in use among the Toltecs; Torquemada and Clavigero says the same of the Chichimecs; and Veytia, in his "*Historia An-*

¹ Sahagun: "*Hist. gen. de las cosas de Nueva España*," vol. III., book X., p. 119.

² "*Chronica de la Orden de N. P. S. Aug.*" Mexico, 1624.

³ Herrera, *loc. cit.*, decade IV., book IX., chap. VII.

tigua de Mejico," says that the bodies of the first Aztec kings were burned.

The Spanish historians have preserved an account of the so-called royal funerals.¹ The body, covered with sumptuous garments, was seated on a lofty throne, and the chief notables came in turn to pay their respects, as they had done when he was still alive. They dwelt upon his virtues, upon the grief his death caused the people, and they prayed him to accept the customary presents. Each notable was bound to offer ten slaves, and a hundred mantles of magnificence corresponding to his standing; the common people then advanced, bringing less costly offerings; lastly came the turn of the women, and while they were presenting to the defunct the food he had preferred, his oldest followers intoned the *Miccacuicatl*, or funeral chant. This was the signal for human sacrifices, the necessary accompaniment of the ceremony. On the fifth day after death, a procession was formed to go to the teocalli. The cortège was preceded by a large banner, on which were painted the chief facts of the life of the deceased; then came the priests with censers, and the servants carrying the body, stretched upon a litter. All around walked the lesser chiefs, wearing dull-colored mantles, trailing upon the ground and covered with paintings and embroidery representing heads or the bones of the dead. The messengers of the chiefs of the adjacent country carried the arms, the insignia, and ornaments for the funeral pyre. The slaves of the king were loaded with clothes and other objects intended for the use of the dead, together with his favorite food. On its arrival at the temple, some priests called *Coacuiles* received the body. Their songs reminded the assistants that they, too, would soon be motionless corpses, flung upon the funeral pile, and that the only testimony in their favor would be their good actions. The functions of these *Coacuiles* were considered

¹ J. de Acosta: "Hist. Natural y Moral de las Yndias," Sevilla, 1590, p. 321, *et seq.* Herrera, *loc. cit.*, decade III., book II., chap. XVIII.; Ixtlilxochitl: "Relaciones;" Kingsborough, vol. IX., p. 370.

so important that they had to prepare themselves for them by rigorous fasts. According to some accounts they wore on these occasions a costume similar to that of the deceased. Other accounts, on the contrary, speak of these Coacuiles as disguised as demons, wearing robes covered with hideous heads, the eyes of which were represented by little bits of mica; others again say the priests were naked, with the body painted black, waving in their hands sticks which they were to use to stir up the fire. The pile was three feet high, the corpse was laid upon it, and when the flames began to rise it was the duty of the assistants to throw into the midst of it the objects they carried, after which fresh sacrifices began.

In the earliest times only a few victims were offered up; but as the pomp of funerals increased with the luxury and wealth of the country their numbers increased. For instance, in honor of Nezahualpilli the throats of two hundred men and a hundred women were successively cut. Sometimes, before his death a chief pointed out those of his concubines who were to follow him. In Michoacan seven women of good family were offered up at the death of the chief. One was charged with the care of the sacred emerald labret that the chief wore hung from his lower lip; another with that of his trinkets; a third was his cup-bearer. All were destined to serve him, and to prepare for him food suitable to the rank which he was to retain in his new life. Those who could be most useful to the deceased were also chosen from among his slaves; but instead of their breasts being opened and their hearts torn out, as was the custom amongst the Aztecs, those who offered the victims were contented with a more ordinary death. The slaves were simply clubbed to death. When the victims of a higher sort were ranged around the pile, one of the relatives of the chief addressed them at length, thanking them for the services rendered the deceased, and urging them to serve him with the same fidelity in the new world that they were both to enter. Then the unhappy wretches were seized one

by one by the priests and stretched upon the sacred stone; the heart was torn out and flung upon the pile, and the corpse was hurriedly carried away.¹

When the body of the chief was completely consumed the fire was put out with the blood of the victims reserved for that purpose. The ashes, calcined bones, and fragments of ornaments were collected and placed in an urn (fig. 122) surmounted by an effigy of the deceased, and this urn was placed, either at the foot of the god to whom the mourners wished to do special honor, or at those of the divinity who had been the protector of the deceased.



FIG. 122.—Aztec mortuary vase.

At the end of the ceremony the assistants took part in a great banquet; they were bound to return daily for four days to the *teocalli* and to renew their offerings. On the fourth day a last sacrifice of fifteen or twenty miserable slaves concluded the affair. With the Chichimecs it was kept up longer, and the sacrifices and offerings had to be renewed through twenty-four days.

The various races which occupied Central America had some knowledge of astronomy. They were acquainted with divisions of time founded on the motion of the sun, and long before the conquest they possessed a regular system.²

¹Gomara, who wrote in the sixteenth century, says that the victim was buried; other historians, that the body was burned on a neighboring pile.

²Ixtlilxochitl ("Relaciones," *l. c.*, p. 322), following in the trail of his priestly instructors, says that in the year 5097 from the creation a meeting of astron-

Amongst the Aztecs it included periods of forty-two years divided into cycles of thirteen years, expressed in their pictographs by hieroglyphic signs. The year consisted of eighteen months, of twenty days each, and five supplementary days, which were looked upon as of ill omen, and during which no Aztec would do any action of importance. Lastly, the days were divided into divisions analogous to our hours. The calculations of their astronomers early proved that the year of 365 days did not correspond exactly with the solar motion; so that, many years before the Gregorian reform was accepted in Europe, they had added thirteen days to each cycle of fifty-two years. In 1790, excavations made at the Great Plaza of the City of Mexico, on the supposed site of the great Teocalli destroyed by the Spainards, brought to light a block of porphyry weighing not less than twenty-three tons. On this block was engraved a circle a little more than eleven feet in diameter, containing the divisions of the astronomical cycle of the Aztecs.¹ Together with the solar year, the Mexicans kept the lunar year, which appears to have been used only for religious holidays. This year was divided into periods of thirteen days, corresponding with the phases of the moon.²

Amongst the Mayas³ and the Toltecs, as amongst the people of Central America, the months also consisted of twenty days; and with them all the number twenty (fingers and toes) appears to have been the base of their system of numeration.

took place at Huhhue-Tlapallan, and it was they who fixed the divisions of time which lasted until the conquest. Professor Valentini, "The Katunes of Maya History," places this change in the divisions of time in the year 29 B. C. Both of these estimates are, perhaps it is needless to say, more or less hypothetical.

¹ It has been reproduced by Charnay, plate I., and Short ("North Americans," p. 409) copies it from him.

² Bancroft, vol. III., p. 502, 755, *et seq.* Bandelier: "On the Special Organization and Mode of Government of the Ancient Mexicans," "Report, Peabody Museum," vol. II., p. 475, 557, *et seq.*

³ The Maya calendar has recently been the subject of exhaustive research by Prof. Cyrus Thomas, of the U. S. Bureau of Ethnology, to whose publications the reader is referred for all details of this branch of the subject.

The chief weapon of the Aztecs was the javelin (*tlacochtli*), a short lance of hard wood, the end of which was provided with a point of flint, obsidian, or, more rarely, of copper. This point was fixed in a slit in the wood, and kept it in its place by lashings cemented with resin. Each warrior also carried darts which he flung from a distance, a bow (*tlauitolli*)¹ often more than five feet long, and slings. The *macuahuitl* (from *macua*, hand, and *cuahuil*, wood) was a wooden sword, of similar form to the two-handed sword (*espadas de dos manas*) of the Conquistadors. The Spanish also tell us that on the edges of this sword were inserted fragments of obsidian as keen as the blades of Toledo. The blows of this weapon,² used by the Aztecs as a club, were formidable; but the obsidian broke at the first shock, and then the *macuahuitl* became useless. The shield, which must not be confused with that carried by the chiefs in dances and processions, was small, round, and wadded with cotton.³ The braves,⁴ such was the title of the chief warriors, fastened it to the left arm. As will be seen, these weapons scarcely differ from those of the other Nahuas, which we have already described.

In some places, the defensive works were important. The way the Mexicans made fortifications was to choose a naturally strong position, such as a hill difficult of access, artificially widening, if necessary, the summit with earth carried up to it, and by surrounding the whole either by stone walls or palisades, essentially in the manner of the Mound Builders and Indians. The height of these walls, with that of the eminence itself, were the chief obstacles encountered by the enemy. The Aztec method resembled that of the Mound Builders, which is yet another indication

¹ Clavigero, *l. c.*, book VII., chap. XXIII.

² "El Conquistador Anonimo," Collection of Unpublished Documents, vol. I., p. 375.

³ "Raccolta di Mendoza," Kingsborough Collection.

⁴ The title, or rather the rank, of *brave* was obtained by some dazzling action. The braves, as amongst the Indians of the present day, took the characteristic names of *flesh-eaters*, *great eagles*, *winged arrows*, and such like.

of a connection that may have existed between them.¹

The costume of the Mexicans consisted of a sleeveless tunic (*nuepil*), fastened to the right shoulder, and of a sash (*maxtlatl*) of gaudy colors. The head, the arms, and the legs were left naked. The chiefs also wore a mantle, the length of which indicated their rank. This mantle was ornamented with feathers, the color of which varied according to the tribe to which the wearer belonged. Clavigero² relates that the soldiers only wore the maxtlatl, and that before going to war they painted their bodies, and especially the face, black. Alvarado, on the contrary, in a letter addressed to Cortes,³ says that the Guatemalians dressed in garments padded with cotton, which came down to the ankles. The shoes (*cactli-cotaras*) resembled the Indian moccasins. They are reproduced on some of the bas-reliefs of Palenque.

As head-dresses, the warriors wore imitations in wood of the heads of the tiger, wolf, and serpent, covered with the actual skin of the animal. The reward of valor in war was the right of wearing, above the ears, one or more partings in the hair. The character of these head-dresses and marks of honor have been preserved to our day by pictography.

In Mexico the chiefs were called *Teachcautin*, or elder brothers. It was their duty not only to lead their soldiers to battle, but to teach them in time of peace their military duties, especially how to handle their weapons. The chiefs wore, as insignia of their rank, ear-plugs like those of the Mound Builders, and labrets,⁴ as may be seen in the representations of them at Palenque and Copan.

The Aztec government is constantly represented as an hereditary chieftainship, strongly organized and supported by subsidiary chiefs, also hereditary. The first hints on this subject come from Cortes himself (*Carta segunda*, pp. 12 and 13).

¹ Tezozomoc, *I. c.*, chap. XC., p. 158-9. Duran, *I. c.*, chap. LVI., p. 443.

² *I. c.*, book VIII., chap. XXIII.

³ A letter of the 28th July, 1524, reproduced by Veytia: "Hist. Ant. de Mejico," vol. I.

⁴ Duran, *I. c.*, chap. XIX., p. 169. Sahagun, book IX., chap. VI., p. 264.

"In the town of Mexico," he writes, "are a considerable number of large and beautiful houses, which are the residences of all the lords of the country, vassals of Montezuma." The almost unanimous accounts of Spanish writers, unconsciously colored, perhaps, by the impressions or prejudices of their country, combined to establish this account. Later researches, however, on the contrary, justify us in supposing that the government was very democratic, and that appointments were given by election.¹

Tlaca-Tecuhltli, the chief of men, the wise veteran, such were the titles he bore, was elected for life. It is fair to add, however, that this king was almost always chosen from the same family. Among the Tezcucans this office passed from father to son; among the Aztecs, from brother to brother, from uncle to nephew, but the hereditary right, if indeed it existed, had to be confirmed by election.² The supreme chief could be deposed; and it was thus that Montezuma was degraded, and replaced by his brother, Cuitlahuatrin.³

Another chief, also elective, bore the grotesque title of *Chihua-Cohuatl*, the "female serpent."⁴ He sat beside the ruler, and it was his duty to preside at the administration of

¹ Bandelier, *l. c.*, "Report of Peabody Museum," vol. II., pp. 95, 475, 557, 600.

² The titles of king, nobles, court, lords, palaces, etc., are misleading as applied to the chiefs of any American races. Nothing resembling monarchy in the civilized sense has ever existed among our aborigines. But this was not realized by the Spaniards, who saw, without understanding, the organization of Mexican society, and applied to it terms with which they were familiar, no matter how unsuitable in reality.

³ Cortes ("Carta segunda") makes, it is true, no allusion to it; but Bernal Diaz de Castillo ("Hist. verdadera de la Conquista de la Nueva España," chap. XXVI., p. 132), Las Casas ("Brevisima Relacion," p. 49), Sahagun (book XII., chap. XXI., p. 28), Torquemada (book IV., chap. LXVIII., p. 494), and Herrera (decade II., book X., chap. VIII., p. 264), are unanimous on this point.

⁴ This dignity does not appear to have existed until after the alliance between Mexico, Tezcuco, and Tlacolpan. Duran, chap. XXIV., p. 205; Tezozomoc, "Chronica," chap. XXIX., p. 35; Ixtlilxochitl: "Relaciones"; Kingsborough, vol. IX.

justice and the receipt of tribute. According to some, he could never go to war; according to others, he commanded the Mexicans, while the Tlaca-Tecuhtli led the allies. The Chihua-Cohuatl alone had the right of wearing a tuft of green feathers on his head, gold rings in his ears and in his lips, an emerald hanging from the cartilage of the nose, gold bracelets, and anklets of rare feathers. On his war costume he also wore a large tress of feathers, which hung down to the waist; and on such occasions used a little drum to give his orders.¹

The aim of war was often merely to secure prisoners necessary for sacrifices. When it was resolved upon, the Mexicans sent ambassadors to the pueblo against which they had a complaint, the ambassadors carrying, as tokens of their mission, an arrow with the point downward and a shield fastened to the left arm.² Arrived at the council, they stated their demands; if the chiefs of the pueblo agreed to them, the envoys accepted the present offered to them; if on the contrary their demands were rejected, they approached the chief of the tribe, painted his arms white, placed feathers on his head, and offered him a sword and a shield. This was the accepted form of a declaration of war, and when it was made the ambassadors had to beat a hasty retreat, or their lives were in the greatest danger.³

In truth neither the Aztecs nor the other Nahuas formed a state, a nation, or even a political society. They were simply a confederation of tribes, these tribes themselves consisting of an agglomeration of clans or *Calpulli*.⁴ This organization presents certain resemblances with that which existed in the north of Scotland and Ireland. All the members of the clan, connected by a real or supposed relationship to a common ancestor and bearing the same name, had a collec-

¹ Duran, *l. c.*, chap. XIV. and XVI. J. de Acosta, *l. c.*, chap. XXV., p. 441.

² Torquemada, *l. c.*, book XIV., chap. I., p. 534.

³ Ixtlilxochitl: "Hist. Chic.," chap. XXXVIII. G. de Mendieta: "Hist. Ecll. Indiana," Mexico, 1870, book II., chap. XXVI., p. 129.

⁴ Bandelier, *l. c.*, p. 557, etc.

tive right in the lands of the tribe, which they enjoyed, paying an annual rent to the chief.

The Calpulli, true families, doubtless united by a close blood-relationship, were responsible for the acts and the conduct of their members. These members were bound mutually to defend each other, to avenge injuries done to any one of them, and to support the old, the infirm, and all those incapable of taking part in the common work.

There was no such thing as private property, at least with regard to land. The lands, which were called *Calpulalli*, belonged to the Calpulli, who could neither sell nor exchange them. They were divided at fixed periods between all the males of the tribe, with the obligation of cultivating them and of residing within the limits of the Calpulli. Some lands (*tlamilli*) were reserved to the chiefs, but neither these chiefs nor their families had any permanent rights in them, and when they gave up office the lands were reabsorbed in the public domain. Other lands (*tlatocatlalli*) were set aside for the tribute that every Calpulli had to pay to the ruler of Mexico. They were cultivated by all the members of the family, and the crops were taken to private storehouses. But for the necessity of making this annual payment, the tribes and Calpulli appear to have been completely independent; their chiefs were elected for life, and no one could interfere with their choice, which almost always fell upon old men who had submitted, or would have to submit, to a very severe religious initiation, which we are about to describe. As will be seen, this collection of institutions shows no trace of feudalism.¹

Descent was through the female line, and the family was constituted by the maternal alliances alone. It was not until later that paternal descent was admitted. Marriage existed; but marriage was forbidden between near relations, and probably between members of the same Calpulli. The position of women was hard; they became in most respects

¹ Orozco y Berra: "Geographia de las lenguas y carta etnografica de Mexico."

the property of their husbands. A marriage could, however, be annulled, on the request of the woman, provided that this annulment had the approbation of the Calpulli, and in that case the woman returned to her own family. Every man was bound to marry when he came to the age of twenty years, with the exception of certain priests, who took a vow of chastity in honor of the gods they served. Polygamy was not forbidden; the husband, or rather the master, had a right to as many concubines as he wished; the necessity of supporting them was the only curb upon his passion.

Patronymic names were unknown.¹ On the birth of her child the mother chose the name she wished given to him; this name was generally connected either with the month in which the infant was born or with circumstances of his birth. When his childhood was over the name by which he was henceforth to be known was given to him by the medicine-man, who played a considerable part amongst the Mexican tribes, as he still does alike amongst the Indians of the pueblos and the wandering Indians. A warrior could get a third name by an act of exceptional bravery; and this name was awarded to him by the Calpulli.

The Calpulli was also charged with the education of children. A public building (*telpuchcalli*) was set apart for this purpose. All the boys without exception went to it; manual work, the art of war, the handling of arms, dancing, and singing formed the rudiments of education.² Those amongst the scholars who were strong enough had to cultivate the lands belonging to the Teocallis, which were set aside for the support of the priest and the expenses of public worship.

Slavery existed amongst the various tribes of Central America. The man belonging to a Calpulli who refused to marry, or who did not cultivate the lands assigned to him, and the prisoners taken in war, unless they were sacrificed to

¹ Torquemada, book XIII., chap. XXII., p. 454, *et seq.*

² Gomara: "Hist. de Mexico," Sahagun: "Hist. Gen.," book III., chap. IV., p. 268, chap. V., p. 269, chap. VIII., p. 275.

the gods, became slaves. They were called *tlacolti*, literally "bought men." If the slave escaped, his master had the right to make him wear a wooden collar. If he ran away a second time he was taken to the temple and immediately slain. If, as very rarely happened, he managed to reach the council-chamber set aside for the chiefs of the tribe, without being arrested either by his master or by any other member of the Calpulli, he received his liberty.¹ The slave who in battle achieved an act of valor not only had a right to his liberty, but he could also be adopted by the Calpulli; henceforth he became one of its members, enjoying the same rights as his brothers, and like them receiving arms. When a slave was not thus liberated he acted as load-bearer during war, as do certain negroes of the interior of Africa at the present day. Beasts of burden were unknown; it was the duty of the porters to carry the necessary maize for the frugal food of the soldiers, the tents and the cords for making them fast, and the poles and straw for the construction of rude huts. In case of capture by the enemy the poor wretches were almost always offered in sacrifice to the gods.

Judging by the accounts which have come down to us, or by the old paintings preserved at Mexico, punishments were severe among the tribes of the Nahuatl race.² According to Las Casas, murder was punished by death³; according to Duran, by slavery for life. The man or woman who wore the clothes of the other sex was also condemned to death. Rape, incest, sodomy, were punished with the same penalty; but for each crime the mode of execution varied: the incestuous criminal was hung⁴; he who violated a child in Michoacan was impaled; the sodomite was burned.⁵ He

¹ Mendieta: "Hist. Ecc. Ind.," book II., chap. XXVII., p. 30.

² Bancroft, vol. II., p. 460, *et seq.* Bandelier, *loc. cit.*, p. 623, *et seq.*

³ "Hist. Apol.," App., Kingsborough, vol. VIII.

⁴ Torquemada, book XII., chap. IV.

⁵ In spite of the severity of this punishment, sodomy was no less common among the Aztecs than among the ancient people of Europe. "A certain number of priests," says Father Pierre de Gand ("Letter included in the Ternaux

who in a battle took possession of a prisoner taken by another, he whose duty it was to cultivate the lands of children or of others unable to till their own ground, and who neglected this duty for two consecutive years, or he who stole gold or silver objects consecrated to the gods, was also punished with death.¹ The same punishment was given for seducing a woman who had taken a vow of chastity, or a married woman belonging to the same Calpulli. The adulteress was quartered, and her limbs were divided amongst all the men of the Calpulli.

The restitution of the stolen objects made amends for the theft; but in default of this restitution the thief became a slave for life. Those guilty of calumny had their lips cut. Old men of more than seventy were alone allowed to get drunk; a drunkard younger than this had his head shaved, and if he held any office he was publicly degraded.

Corporeal punishment was rare. It was considered shameful even for a slave to be chastised. Pictography, however, shows us a father or a master chastising a child with a whip. There were prisons in the different Teocallis and the public buildings²; and, if we can trust the Conquistadores, these prisons were pestilential places, in which the air was so vitiated that the unfortunate wretches sent to them rapidly perished by suffocation.

No written laws regulated those various penalties; they were probably inflicted in accordance with ancient customs, and must certainly have varied amongst the different tribes.

We have said that the association of the clans or Calpulli, united by the bonds of a common territory, common religious rites and a common language, formed the tribe. Some

Compans Collection,¹ 1st series, vol X., p. 197), could not have wives, *sed earum loco pueros abutebantur*. The sin was so common that young and old were infected by it." We must, however, make some allowance for exaggeration.

¹ Mendieta, *loc. cit.*, book II., chap. XXIX. Vetancurt: "Teatro Mexicano," vol. I., p. 484.

² *Teitlipiloyan* or *Tecaltsagualoyan*. Mendieta, *loc. cit.*, chap. XXIX., p. 138. Molina: "Vocabulario in lengua Castellana y Mexicana," Mexico, 1571, vol. II., pp. 86-91.

tribes are mentioned which included as many as twenty Calpulli.

The tribe was governed by a council composed of delegates from each Calpulli (*tetoani*, orators, or *techutatoca*, talking chiefs). They met in the *tecpan*, or council-chamber, and it was their duty to uphold the ancestral customs, and especially to maintain harmony among the Calpulli, which was, according to the chroniclers, a very difficult task.¹

In the tribe, as in the Calpulli, no office or dignity was hereditary. They were obtained by election, with the exception of the title of *Tecuhtli* (grandfather), which was given as a reward for acts of bravery before the enemy, for long and important services either in the council or in the embassies, of which we have described the perils. It was also possible to obtain it by a series of initiations, to which he who aspired to this honor had to submit. During four days and four nights he was shut up in the chief teocalli of the tribe and subjected to a most rigorous fast. He was bled from every part of his body; all sleep was forbidden to him; his keepers tore off his clothes, scourged him cruelly, and to add to his misery they partook before him of sumptuous feasts, at which he had to look on without for an instant losing his impassibility. The four days over, the novice returned to his Calpulli, where he passed an entire year in retreat and the most rigorous penance, mutilating himself and inflicting often intolerable bodily torture. Throughout this time his brothers collected the presents that they were bound to offer to the gods, chiefs of the tribe, priests, and medicine-men. At the expiration of the year, the future *Tecuhtli* had to go back to the teocalli and to submit anew to the tests he had already gone through, and which terminated at last in a grand feast, at which were given to him the ornaments that he had henceforth the right to wear, and which appear to have been his only privilege.²

¹ A. de Zurita: "Rapport sur les différentes classes de chefs de la Nouvelle Espagne," Ternaux Compans, 2d series, vol. II.

² Sahagun, book VIII., chap. XXXVIII., p. 329. Ixtlilxochitl: "Rela-

We have now summarized the facts actually known of the organization and government of the various people belonging to the powerful Nahuatl race, who successively overran Central America, and especially Anahuac. We have still to speak of the ruins, the importance of which becomes each day more apparent, which rise before the eyes of the traveller even in deserts and in the midst of forests previously reputed impenetrable.

Before touching these new questions, we must not omit one remark which cannot fail to have occurred to the reader. Long before the Spanish conquest the people of America had reached that state to which modern socialism would return, and of which the latter claims the honor and the profit; the absence of all hereditary principles in property as in the family; communism alike in the pueblo and in the Calpulli; the omission, strange as it may appear, of any name transmitted from father to son which could perpetuate in descendants the glory of ancestors; the education in common of all children under the sole authority of representatives of the Calpulli; election to all offices and all posts; the merging of the individual for the good of the community. To what did these institutions lead, which ignorance and theory delight in holding up to the human race as the beacon lights of the future? To the most complete anarchy; to struggles without end or truce between tribe and tribe, Calpulli and Calpulli; to hatred so fierce that the Spanish appeared as liberators, and owed their victory as much to the services of allies, eager to escape from the yoke which weighed them down, as to the courage of their own soldiers.

ciones," app., p. 257. Mendieta, book II., chap. XXXVIII., p. 156. It is curious to meet with ceremonies somewhat like these amongst the Incas and the Indians of Orinoco (Bandelier, *l. c.*, p. 643 and note 171).

CHAPTER VII.

THE RUINS OF CENTRAL AMERICA.

IN a previous chapter we gave a summary of the best available information about the races who occupied Central America, pushed southward, founding confederacies, building towns, and covering whole regions with their structures, to disappear, leaving hardly a name in history, or a memory in tradition. To complete this study, we must now ascertain what the monuments, or rather the ruins, that time and men have alike been powerless to destroy, can tell us.

One preliminary remark must be made. We hardly meet with such grand structures as those of Egypt or Assyria, of India or of China, except under similar circumstances; almost essential for their erection were a people living under despotic government, and a conquering race forcibly compelling a subject people to do the necessary work. The conquerors contributed their taste, their traditions, and their peculiar genius; the conquered contributed the material elements with their labor and the sweat of their brow. We are hardly yet justified in asserting that similar events took place in America, though we may suspect that the monuments still existing had a similar origin.

The researches, made at the cost of difficult and often dangerous explorations, have rendered possible some attempts at classification; and we can already distinguish between Maya and Nahuatl architecture; and among the Mayas themselves, between the style of the buildings of Chiapas and those of Yucatan.¹

¹ Short, "North Americans of Antiquity," p. 340.

The monuments of Palenque¹ are justly reckoned amongst the most remarkable in Chiapas. The town stands in the region watered by the Usumacinta, where settled the first immigrants of whom it has been possible to distinguish traces. The position of Palenque, at the foot of the first buttresses of the mountain-chain, on the banks of the little river Otolum, one of the tributaries of the Tulija, was admirably chosen.² The streets extended for a length of from six to eight leagues, irregularly following the course of the streams which descend from the mountains and furnished the inhabitants with an abundant supply of the water necessary to them. At the present day the ruins rise in solitude, which adds to the effect produced by them. They were long altogether unknown; Cortes, in one of his expeditions, passed within a few miles of Palenque without suspecting its existence; and it was not till 1746, that chance led to its discovery by a curé of the neighborhood.³

We owe the first description of the ruins to José de Calderon, who had been sent by the Spanish government to examine them. His account is dated December 15, 1764. Since then they have been visited by numerous explorers; only a year or two ago Charnay returned a second time from Palenque, and the casts taken by him of the hieroglyphics there are among the most curious possessions of the new Trocadero Museum at Paris.

¹ Palenque comes from a Spanish word signifying palisade; the ancient name of the town is still unknown.

² A. del Rio, "Descripcion del terreno y poblacion antigua," English translation, London, 1822. Captain Dupaix, "Relation des trois expéditions ordonnées en 1805, -6, and -7, pour la recherche des antiquités du pays notamment de celles de Mitla et de Palenque," 3 vol, fol. Paris, 1833. See also Kingsborough, *l. c.*, vols. V. and VI. Waldeck: "Voy. arch. et pittoresque dans la province du Yucatan," fol. Paris, 1838. Stephens & Catherwood: "Incidents of Travel in Central America," New York, 1841; "In Yucatan," New York, 1858, by the same authors. Brasseur de Bourbourg: "Recherches sur les ruines de Palenqué avec les dessins de Waldeck," fol. Paris, 1866. Bancroft, *l. c.*, vol. IV., p. 289, *et seq.*, gives a very complete bibliography, which is useful to consult.

³ In 1750, according to D. Diego Juarros: "Hist. of the Kingdom of Guatemala," London, 1823.

Among the best-preserved ruins may be mentioned the palace, the temple of the three tablets, the temple of the bas-reliefs, the temple of the cross, and the temple of the sun. We keep the names given by various explorers in the absence of better ones. There are others, but of less importance. Dupaix speaks of eleven buildings still standing, and a few years before A. del Rio mentioned twenty; Waldeck says eighteen, and Maler, who visited the ruins of Palenque in 1877, fixes the number of the temples or palaces at twelve. These contradictions are more apparent than real, and are explained by the different impressions of each traveller, and the divisions he thought it necessary to adopt.

The palace, the most important building of Palenque, rests on a truncated pyramid¹ about forty feet high, the base of which measures from three hundred and ten feet by two hundred and sixty. The inside of this pyramid is of earth; the external faces are covered with large slabs; steps lead up to the principal building, which forms a quadrilateral of two hundred and twenty-eight feet by one hundred and eighty²; the walls, which are two or three feet thick, are of rubble, crowned by a frieze framed between two double cornices. Inside as well as outside they are covered with a very fine and durable stucco, painted red or blue, black or white. The principal front faces the east; it includes fourteen entrances about nine feet wide, separated by pilasters ornamented with figures. These figures measure more than six feet high, and are full of movement; while above the head of each are hieroglyphics inlaid in the stucco (fig. 123). Some day, perhaps, a key to them will be

¹Some subterranean galleries have been made out in the interior of the pyramid. These pyramids, which remind us of the work of the Mound Builders, are the most striking characteristics of the architecture of Central America.

²Stephens, *l. c.*, vol. II., p. 310; Waldeck: "Palenque," pl., II.; Armen ("Das heutige Mexico") gives a ground-plan and an attempt at restoration of the temple. Bancroft also gives an attempt at restoration (*l. c.*, vol. IV., p. 323).

discovered and the history of Palenque be revealed. Numerous masonry niches in the wall merit special attention on account of their resemblance to the letter T or rather the Egyptian *tau*.¹ Waldeck made out on some of them marks of smoke, from which he concluded that they were intended to hold torches; others may have been



FIG. 123.—Stucco bas-relief from Palenque.

used for supplying the passage-ways with air and light of which they stood in great need.

¹ "As for the figures of *tau*, so numerous in the buildings, ornaments, bas-reliefs, and even in the form of the lights, although it is impossible to pronounce an opinion on this point in the present state of our knowledge, we cannot avoid noticing it." Jomard : *Bull. Soc. Géog.*, de Paris, vol. V., series II., p. 620. One of the bas-reliefs of the palace figured by Bancroft (*l. c.*,

The inside of the palace corresponds with the magnificence of the outside; there are galleries forming a peristyle all round the court; and the rooms are decorated with granite bas-reliefs (fig. 124), grotesque figures, some thirteen feet high. The drawing and the anatomical proportions are tolerably correct, and the expression of the figures speaks well for the skill of the artist; but the execution is weak, suggesting an art in decadence rather than the ruggedness of one in its infancy.¹



FIG. 124.—Bas-relief of the palace of Palenque.

These rooms were united by corridors; we reproduce a section of one of them (fig. 125), which will give an idea of the mode of its construction. The architects of Palenque were ignorant of the arch, and their vaults were formed of over-sailing courses, one above the other, as in the cyclopean monuments of Greece and Italy.

vol. IV., p. 317) is a figure wearing an ornament in the form of the *tau*. In chapter VIII, we mention some windows which are also of this form in the Yucay valley, Peru. We know that the *tau*, in Egyptian hieroglyphics, signifies life. Max Uhlen: "Handbuch der gesamten Aegyptischen Alterthumskunde," vol. I., p. 108.

¹ Viollet le Duc, in Charnay: "Cités et Ruines Américaines," Int., p. 74.

The building is finished off with a tower of three stories, measuring thirty feet square at the base. Here, too, we find symbolical decorations, which are very rich and in a very good state of preservation. There is nothing to indicate the age of this palace; it was, as we have said, abandoned at the time of the Spanish conquest, at which epoch, moreover, none of the races peopling America were in the habit of constructing similar buildings. We can, however, fix a certain limit to its age; for, with tropical rains lasting six months a year, and the luxurious vegetation which fills all the crevices, no monument could last for a number of centuries, such as is attributed, for instance, to the buildings of Egypt; and the most daring conjectures do not admit of

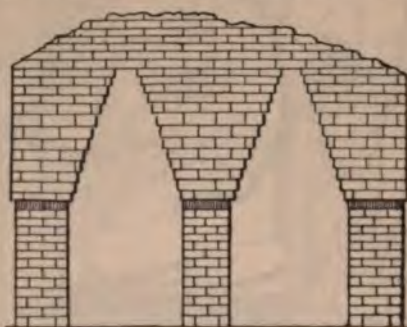


FIG. 125.—Section of a double corridor at Palenque.

our dating the monuments of Palenque earlier than the first centuries of our era.¹ After this last visit, indeed, Charnay no longer accepts so remote a date as that, but thinks that all the monuments of Yucatan are the work of the Toltecs, and were built between the twelfth and fourteenth centuries.² It is impossible that these delicate ornaments, made of little lozenge-shaped bits of cement stuck on to the wall, could have longer resisted the effects of a destructive

¹ Bancroft (vol. IV., p. 362, note 68) gives a list of all the hypotheses as to the date of the foundation of Palenque. They vary from the date of the deluge to the fifteenth century of the Christian era. The margin, it will be seen, is wide.

² *Bull. Soc. Géogr.*, November, 1881.

climate. Another no less important remark must be made. The staircases are new, the steps are whole, the edges are sharp; nowhere do we see any traces of wear and tear, the certain proofs of long habitation. The conclusion is inevitable; the people of Palenque, for reasons which are still unknown, evacuated the town soon after the construction of the chief buildings.

The size of the trees overgrowing the roofs and the pyramids had hitherto been accepted as a conclusive proof of the antiquity of these buildings. It was by relying upon such evidence that Waldeck spoke of 2,000 years; and Larraínzar speaks of one tree amongst the ruins, on which he was able, with the help of a microscope, to count as many as 1,700 concentric circles, to which, founding his opinion on the formerly received data, he assigned an antiquity of 1,700 years. But here again Charnay comes to totally different conclusions. He had a shrub cut down, eighteen months old at most, and found in it eighteen of these circles. His first thought was, that he had come upon an anomaly; but after having several trees of different kinds and sizes cut down, he found in all of them similar phenomena in similar proportions.

Nor is this all; at the time of his first visit to Palenque in 1859, Charnay had the trees hiding the ruins cut down, so as to take more exact photographs. Other trees grew up in their places, which trees must have been twenty-two years old in 1881. On a section of one of these, rather more than two feet in diameter, he counted 230 concentric circles. This is an important fact of vegetable physiology, and proves that we cannot estimate the age of trees in the tropics by the same process as we do that of those in northern latitudes (which for that matter also afford but imperfect evidence), and the chief proof of the antiquity of the buildings of Palenque falls through completely.

It would take too long to describe the other monuments of Palenque, which are known under the name of temples.¹

¹ The great temple of Palenque bears a curious resemblance to that of Borobudur, in the island of Java. *Edinburgh Review*, April, 1867.

We must, however, mention one of them, situated on the other bank of the Otolum, and known under the name of the Temple of the Cross. It rises from a truncated pyramid and forms a quadrilateral with three openings in each face, separated by massive pilasters, some ornamented with hieroglyphics and some ornamented with human figures. The frieze is also covered with human figures, and amongst those still visible Stephens mentions a head and two torsos, which, in their perfection of form, recall Greek art. The openings, all at right angles, lead into an inside gallery communicating with three little rooms. The central one of these rooms contains an altar, which fairly represents an open chest, ornamented with a little frieze with a margin. From the two upper extremities of this frieze spring two wings, recalling the mode of ornamentation so often employed in the pediments of Egyptian monuments.¹

Above the altar was originally placed the tablet of the cross (fig. 126), which was afterward torn from its position by the hand of a fanatic, who chose to see in it the sacred sign of the Christian faith, miraculously preserved by the ancient inhabitants of the palace. The tablet was taken down and then abandoned, we know not why, in the midst of the forest covering part of the ruins. Here it was that the Americans discovered part of it, took possession of it, and carried it to Washington, where it forms part of the collection of the National Museum.² The centre represents a cross, resting upon a hideous figure, and surmounted by a grotesque bird. On the right, a figure on foot is offering presents; on the left, another figure, in a stiff attitude, seems to be praying to the divinity. The costume of these two persons is unlike any that is now in use; and above their heads we can make out several hieroglyphical characters. A slab on the right is also covered with them. In the present state of knowledge it is impossible to make

¹ Charnay, *loc. cit.*, p. 417, from whom we borrow the greater part of these details. Del Rio, *loc. cit.*, p. 17. Waldeck, plate XX. Stephens, *loc. cit.*, vol. II., p. 344.

² Ch. Rau: "The Palenque Tablet," Smith Cont., vol. XXII.

out whether these inscriptions are prayers to the gods, the history of the country or that of the temple, the name or the dedication of the founders.

At the end of the sanctuary recently discovered near Palenque¹ (fig. 127, p. 326), by Maler, are three slabs of sculptured stone in low relief. On the right and left are

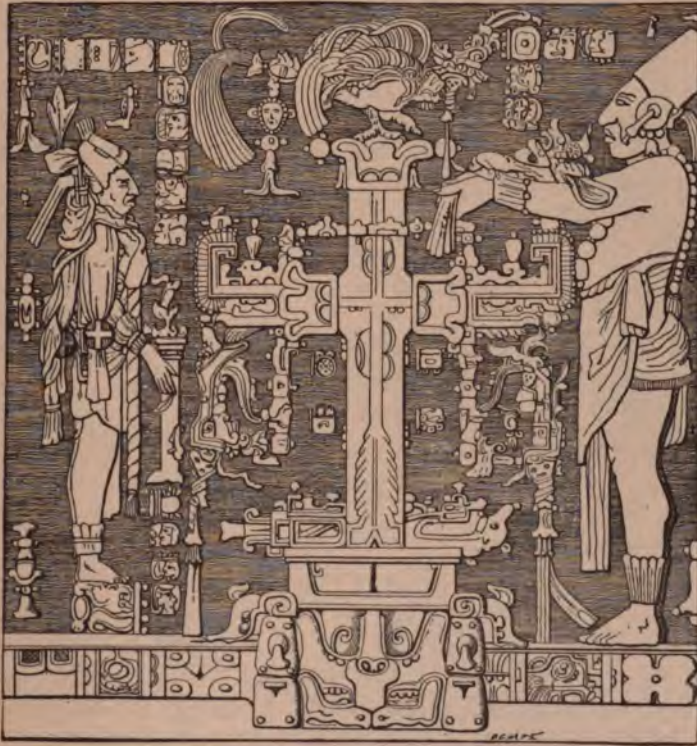


FIG. 126.—Tablet of the cross at Palenque.

hieroglyphics; in the centre a cross, surmounted by a head of strange appearance, wearing round the neck a collar with a medallion; above this head is a bird, and on either side are figures exactly like those of the temple of

¹ *Nature*, October 4, 1879.

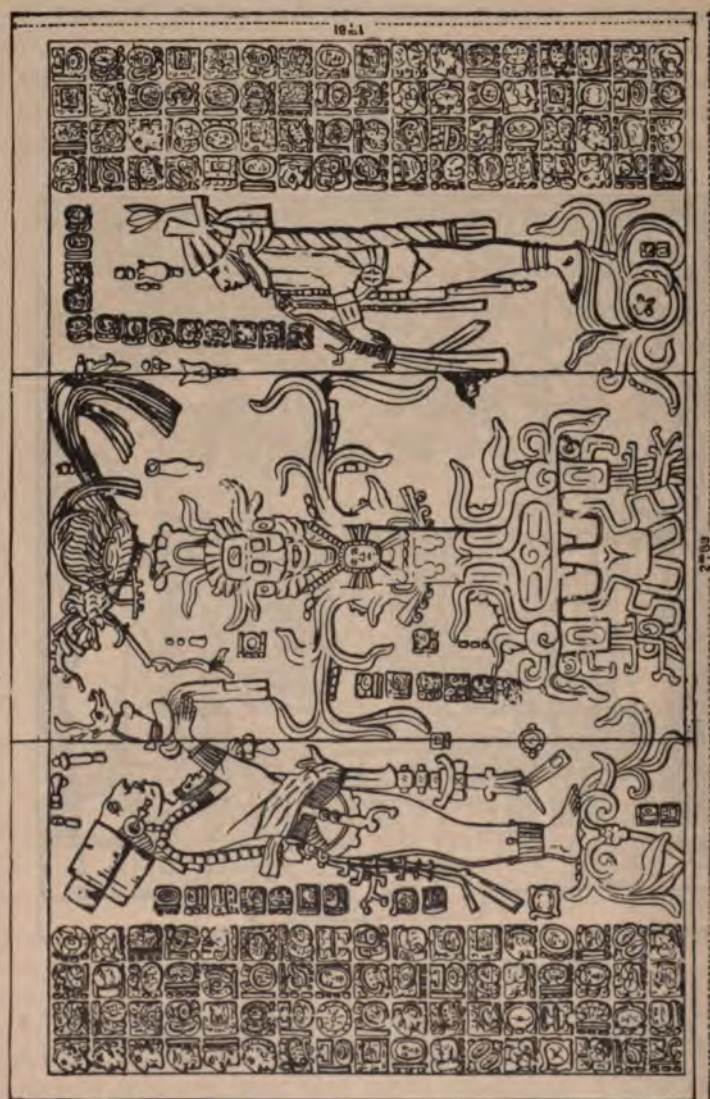


FIG. 127.—Bas-relief discovered by Maler near Palenque.

the cross. Evidently this was a hieratic type, from which the artist was not allowed to depart.

The existence of the cross at Palenque, on one of the monuments of an earlier date than the introduction of Christianity, is not an isolated fact. Palacio, the judicial assessor, saw at Copan a cross, with one of its arms broken¹; the Jesuit Ruiz mentions one in Paraguay; Garcilasso de la Vega, another at Cuzco; and we have previously referred to several examples. The cross is supposed to have been looked upon as the symbol of the creative and fertilizing power of nature, and in several places was honored by sacrifices of quails, incense, and lustral water.

We cannot leave the ruins of Palenque without mentioning a statue (fig. 128), remarkable for more than one reason.² The calm and smiling expression of the face resembles that of some of the Egyptian statues; the head-dress is a little like that of the Assyrians; there is a necklace around the neck; the



FIG. 128.—Statue from Palenque.

¹ "Carta dirigida al Rey de España año 1576," published at Albany, with an English translation in 1860.

² The height of the statue is 10 ft. 6 in., and there was another, a counterpart of it. They were evidently both intended to form pilasters, for one side of each was left in the rough; they were discovered and figured by Waldeck.

figure presses upon its bosom an instrument, and rests its left hand upon an ornament, the meaning of both of which it is difficult to imagine. The plinth of the statue has a cartouch with a hieroglyphical inscription,¹ probably giving the name of the god or hero to whom it was dedicated.

There is a very distinct resemblance in some of these hieroglyphics to those of Egypt. We mention this without however trying to solve, by a few accidental resemblances, the great problem of the origin of races, still less to establish the existence of a connection between the inhabitants of Egypt and those of Central America at the comparatively recent date of the erection of the monuments of Palenque.

Two races successively bore the name of Quiché. The old Quichés of Maya origin, to whom we owe the monuments of Copan and of Quirigua, and the Cakchiquel Quichés, who were probably descended from the first, but had been greatly modified by various Nahuatl influences. These latter still existed as a people at the time of the Spanish invasion; they offered vigorous resistance to the Conquistadores, and their capital, Utatlan, was taken and destroyed.

Copan is now a miserable village, a short distance from the ruins, famous alone for the excellence of its tobacco, which rivals that of Cuba. The ancient town was situated at the foot of the mountains separating Guatemala from Honduras,² on the Rio Copan, a tributary of the Motagua, which flows into the Bay of Honduras. Its ruins have long been overgrown by the dense vegetation of the forests, which can only be penetrated with axe in hand; hence the oblivion in which they have so long been shrouded, and in which they still remain in spite of their great interest. They

¹ In the various hieroglyphics that we reproduce, the existence can be made out of several dots in regular order, separated by a stroke from the rest of the inscription; this is perhaps a key for a future Champollion.

² The ruins are situated in N. Lat. 14° 45' and W. Long. 90° 52'. Copan has sometimes been confounded with the town which in 1530 offered so heroic a resistance to Hernandez de Chiaves.

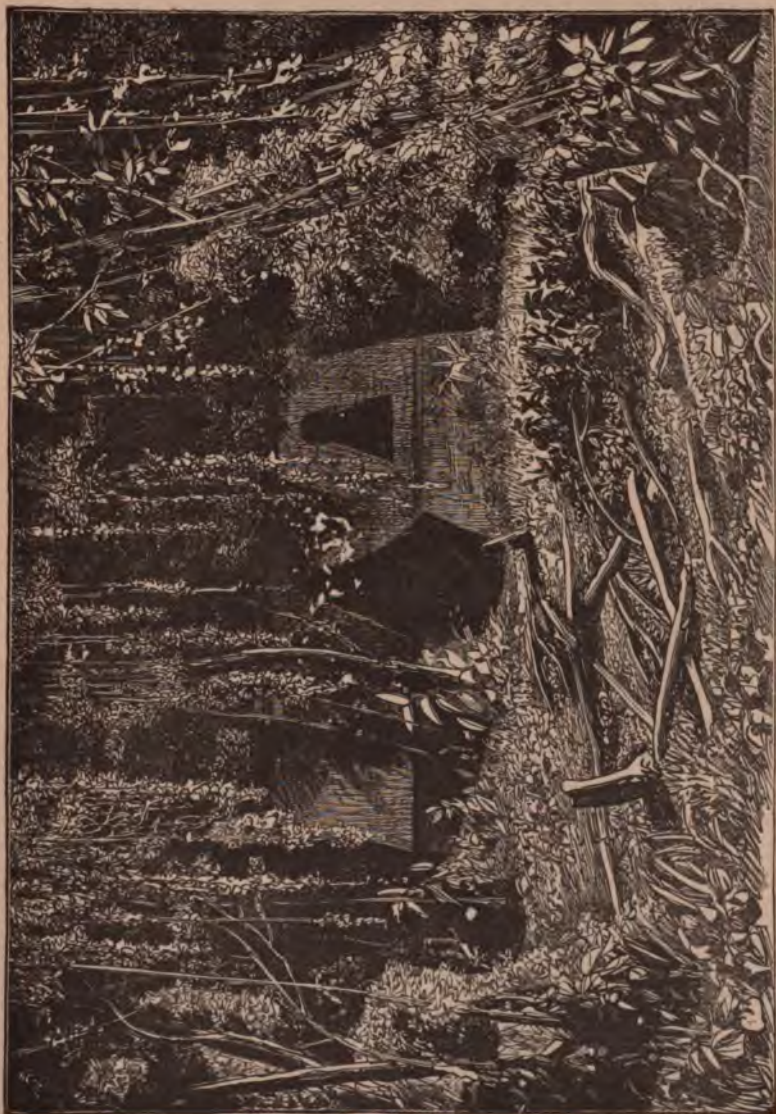


FIG. 129.—Temple near Palenque.

are first mentioned in a letter addressed in 1576 to King Philip II., by Diego de Palacio; but it is to Stephens that we owe the only complete description in existence, and it is this description which is referred to by the Abbé Brasseur de Bourbourg, who visited Copan in 1863 and 1866.¹

In their present state the ruins cover an area of 900 feet by 1,600. The walls, built of immense blocks of stone, and partly destroyed by the roots of trees which penetrate them everywhere, are twenty-five feet thick at their base, and in some places rise in terraces, and still preserve some traces of painting. The chief building, known under the name of the temple, is situated on the northwest of the enclosure; its form is that of a truncated pyramid, the sides of which are six hundred and twenty-four feet high on the north and south, and eight hundred and nine on the east and west. The walls on the side facing the river are perpendicular, and vary from sixty to ninety feet in height; on the other side they slope considerably. It is scarcely necessary to call attention to the resemblance of this building to the mounds of Mississippi and Ohio. The pyramids were dedicated to the gods of the Mayas, and it was on the platform crowning them, that these people attempted to honor their gods by sacrifices which were too often bloody.

Beyond the river fragments of walls, terraces, and pyramids, which cannot now be completely made out, stretch away in the direction of the forest; mountains of rubbish indicate the sites of buildings now crumbled, promising an ample harvest to future archæologists.² In one of the rooms of the palace Col. Galindo discovered several

¹Besides those whom we have already named, we may mention among the explorers, Francisco de Fuentes in 1700; his account has been published by Domingo Juarros, "A Statistical and Commercial Hist. of Guatemala," London, 1824, and by Col. Galindo in 1832, *Bull. Soc. Géog. de Paris*, series II., 1836, vol. 5, p. 267. Stephens and Catherwood visited the ruins in 1839. Their work is entitled, "Views of Ancient Monuments in Central America, Chiapas, and Yucatan," fol. New York, 1844. Bancroft gives for Copan, as for Palenque, a very complete bibliography.

²Galindo, "Am. Ant. Soc. Trans.," vol. II., p. 547.



FIG. 130.—Statue found amongst the ruins of Copan.

vases of red earth, containing bones mixed with lime.¹

A great number of statues, obelisks, and columns, laden with sculpture and hieroglyphics,² form the most interesting discoveries made at Copan. We give an illustration of one of these statues (fig. 130), which seems to mark the zenith of Maya art, and in which we know not what is the most astonishing, the grotesqueness of the design, the richness of the ornamentation, or the delicacy of the execution. We may also mention an alligator, holding in its mouth a figure with a human head and the extremities of an animal; and a gigantic toad with feet ending in the nails of a cat.

On the faces of one of the pyramids included in the perimeter of the principal enclosure are rows of heads (fig. 131). Some of these are skulls,³ others the heads of monkeys, which animals are very numerous in the neighborhood, and may have been the objects of the veneration, or even of the worship, of the inhabitants. A human face (fig. 132) found near the temple, also deserves to be reproduced. The inhabitants of Copan have left their portraits in the bas-reliefs, they have hewn them out of hard stone, they have modelled them in earthenware. The desire of perpetuating his memory is a feeling innate in man; we meet with it in every clime and through every age.

The whole of Yucatan is covered with interesting ruins. In the north are Izamal, Ake, Merida, Mayapan; in the centre, Uxmal, Kabah, Labna, and nineteen other towns, the extent of which attest their importance; and in the east, Chichen-Itza, one of the wonders of America. The southern districts, especially that bordering on Guatemala, are less known, but it has already been ascertained that brilliant discoveries are reserved to explorers in the province of Itur-

¹ *Bull. Soc. Geog.*, vol. V., 2d series, Paris, 1836.

² These hieroglyphics resemble those of Palenque, and like the latter are still undeciphered.

³ There are other examples of this style of decoration. At Nohpat a frieze has been found covered with skulls and cross-bones. Nohpat may have been a town as large as Uxmal; but the ruins themselves have almost entirely disappeared. Stephens: "Yucatan," vol. II., p. 348.

bide. "That extensive ruins yet lie hidden in these unexplored regions can hardly be doubted; indeed, it is by no means certain that the grandest cities, even in the settled and partially explored part of the peninsula, have yet been described."¹ Bancroft's prediction has been verified, and while this volume was in press, Charnay discovered, on the borders of the province of Pachuco, and of the country claimed by Guatemala, a town in ruins, containing monuments of the same style as those of Palenque. The origin and the name of this town are alike entirely unknown, and Charnay thought himself authorized to call it *Lorillard City*. The decoration consists chiefly of stucco, which is in a very bad condition; the skilful explorer was, however, able to remove five bas-reliefs, and take casts from them. As at Palenque, we find a cruciform symbol; but it resembles rather the Buddhist than the Christian cross.² Most of these ruins have been described, so we content ourselves with giving a rapid summary of the most important of them.



FIG. 131.—Head of a monkey on a pyramid at Copan.

One preliminary remark must be made. There are notable differences between the monuments of Chiapas and those of Yucatan. "The mode of construction of Palenque," says M. Viollet-le-Duc, "did not consist, as at Chichen-Itza, or Uxmal, in facings of dressed stone in front of cyclopean masonry; but in covering the masonry with coatings of ornamented stucco and with large slabs."

The character of the sculpture at Palenque is far from possessing the energy of that met with in the buildings of Yucatan. The types of the persons represented differ yet more. They have features very dissimilar to those of the

¹ Bancroft, *l. c.*, vol. IV., p. 148.

² Hamy: Soc. of Geog., meeting of January 2, 1882.

Aryan race at Palenque. They sensibly resemble it at Chichen-Itza. Lastly, it is only in the monuments of Yucatan that we can trace the influence of earlier construction in wood.¹

"Nothing," adds Charnay, after his first exploration, "can vie with the richness, grandeur, and harmony of the buildings of Uxmal. It is not improbable that the founders of the ancient towns of Yucatan were descended from the inhabitants of Palenque, or at least that their civilization grew out of that much more ancient one."



FIG. 132.—Fragment found near the temple of Copan.

To these very just remarks we must add, that at Copan these differences can already be established. The sculptures, and the ornaments covering them, differ from those of Palenque, and more nearly approach those we are about to describe at Uxmal and at Chichen-Itza. Here, then, we have the point of union between two modes of structure, which differ in appearance alone.

The origin of the name of Uxmal is unknown. The ruins are about thirty-five miles from Merida, and cover a consid-

¹ Viollet-le-Duc, *Int.*, p. 97, after Charnay: "*Cités et Ruines Américaines.*" We must say, however, in regard to the reference he makes to the Aryans, that so far there is nothing to justify any one in connecting the Aryan with the American races.

erable area.¹ The *Casa del Gobernador* (fig. 133), the most remarkable of all, rises from a natural eminence artificially enlarged by means of rubble masonry, and cut by three successive terraces; the walls are of rough stone, cemented with very hard mortar. The *Casa* itself is three hundred and twenty-two feet long by thirty-nine wide and about twenty-six high. The interior includes a double corridor, the section of which recalls that which we have described at Palenque (fig. 125), and several rooms of very varying dimensions. The walls of these rooms are of rough stone, without traces of painting or sculpture; in one or two places only are there traces of plaster. The doors were surrounded with lintels of sapotilla wood, and one of these lintels, covered with finely under-cut ornaments, is in the National Museum at Washington.

All the richness of ornamentation was reserved for the external walls. At about one third of the height a frieze runs round the building, presenting a series of curved lines, arabesques, and ornaments of every kind of execution, as capricious as it is grotesque.² Amongst these ornaments Greek frets are prominent; this type of ornament, so common for centuries in Europe, furnishes yet another proof of the similarity of the genius of man, everywhere and at all times, as manifested in the least important of his works.

Amongst these ornaments some elephant-trunks are supposed to have been made out; this would be a curious fact,³ if true, for the elephant was certainly not living in America at the time of the erection of the monuments of Uxmal. His memory must then have been preserved in a permanent tradition, and it is possible that this may turn out to be an

¹ Waldeck: "Voy. pittoresque et arch. dans la Prov. de Yucatan," fol., Paris, 1838. Norman: "Rambles in Yucatan," New York, 1843. Baron von Friederickstahl: "Les Monuments du Yucatan," 1841. Charnay: "Cités et Ruines Américaines," Paris, 1863. Bancroft: "Native Races," vol. IV., p. 149. Short: "North Americans of Antiquity," p. 347.

² Brasseur de Bourbourg: "Hist. des Nat. Civ. du Mexique et de l'Am. Centrale," vol. II., p. 23.

³ We meet with this ornament at the Casa Grande of Zaya, at a short distance from Uxmal. It is possible that the sculptures may relate to the tapir.

indication of the Asiatic origin of the civilization under notice.

Other animals also served as models to the workmen; at the *Casa de Tortugas* the decoration consists of an imitation of palisades formed of round wooden posts. Tortoises in relief are the sole interruption to the horizontal line of the upper frieze.

In front of the palace, a round stone several yards high,



FIG. 133.—Casa del Gobernador, Uxmal.

without ornaments, without even a trace of human workmanship, rises like a column; other similar stones were erected in various parts of the town. Some think these are phallic emblems, and hence conclude that the ancient people of Yucatan were devotees of the phallic cultus. But Brasseur de Bourbourg (*l. c.*, vol. IV., p. 67) tells us that the natives call these stone *picotes* and think they were intended to be

used as whipping-posts. Would it not be more natural to look upon these stones as gnomons, similar to those we shall have to describe later in speaking of the monuments of Peru?

The *Casa de Monjas* is looked upon as the most remarkable building of Central America. It presents considerable resemblance with the *Casa del Gobernador*. Here too we see the traditional mound, surmounted by a platform, on which rise four different buildings surrounding a court.¹ These buildings contain eighty-eight rather small rooms, at regular intervals, reminding us of the pueblos of New Mexico. The inside walls are bare and doors are altogether wanting. It is evident that the inhabitants, protected by their poverty, or perhaps by the sanctity of the spot, lived in complete security.

The outer walls are adorned with a vast frieze in which the grandeur and originality of native art are alike displayed. "Every alternate door" says Charnay (p. 364), "is surrounded by a niche of marvellous workmanship; these were to be occupied by statues. As for the frieze itself, it is a remarkable collection of pavillions in which curious figures of idols grow, as if by accident, out of the arrangement of stones, and remind us of the enormous sculptured heads of the palace of Chichen-Itza; finely executed curved bands in stone serve as frames to them, and vaguely suggest hieroglyphic characters; then follows a succession of Greek frets of large size, alternating at the angles with squares and little rosettes of admirable finish." It is estimated that all these sculptures cover an area of twenty-four thousand square feet; no two are alike, and the artist has everywhere been able to give free scope to his imagination.

The western building is the most remarkable of this collection of structures but unfortunately a great part of it has crumbled away. The left wing, *Casa de la Culebra*, still

¹ The measurements of these buildings given by different explorers differ considerably among themselves. Bancroft (vol. IV., p. 174) gives them all. We refer the reader to him.

standing, represents a huge rattlesnake, running all along the facade, the interlacing coils of its body serving as frames to different panels.¹

The northern building, rising from a platform about twenty feet high, dominates the whole court.² It was surrounded by thirteen towers, each seventeen feet in height, loaded with ornaments. Of these towers four only were still standing at the time of Stephens' visit. On these towers two figures were noticed exhibiting priapism; this fact would tend to confirm the existence of the phallic cultus at Uxmal.

In some places, better protected against the inclemency of the weather, traces have been made out of pictures drawn with a rich and brilliant red.³

The purpose of the *Casa de Monjas* is quite unknown. It has, however, been supposed that it was the residence of Maya virgins, who, like the Roman vestals or the Peruvian Mamacunas, kept up the sacred fire. There is nothing either to confirm or to contradict this idea. Amongst the other buildings of Uxmal, we will mention the *Casa del Adivino*, with the outer walls painted in different colors, rising from a pyramid eighty-eight feet high, and built of rubble set in mortar. The *Casa del Enano*, or "house of the dwarf," says Charnay, "consists of a structure with two inner rooms and a sort of chapel below. This little piece is chiselled like a jewel." Waldeck (p. 96) says it is a masterpiece of art and elegance. "Loaded with ornaments more rich, more elaborate and carefully executed than those of any other edifice in Uxmal."⁴ Besides these there are the *Tolokh-eis*, or holy mountain, and the Kingsborough pyramid. At a short distance from the town are other ruins, dating probably from the same period, of the same style of architecture, and rising invariably from mounds which form a lower platform. This was evidently a general custom, and extended from the temple of the gods to the chief's houses.

¹ Charnay, *l. c.*, p. 367.

² Waldeck, *l. c.*, pl., XIII and XVIII.

³ Stephens: "Yucatan," vol. II., p. 30.

⁴ Stephens: "Yucatan," vol. I., p. 313

In describing the shell-heaps, mounds, and cliff-dwellings, we had frequent occasion to speak of the stone or bone instruments or fragments of pottery bearing witness to the presence of man. We have no similar discovery to relate, either at Palenque, Copan, Uxmal, or the other towns of which we shall have to speak, and the excavations hitherto made have only yielded a few flints and still fewer fragments



FIG. 134.—Portico at Kabah.

of pottery. It is, however, impossible that such monuments could have been created without an important population and a long residence. Why have the weapons, implements, and vases disappeared? Why do the graves of the builders of the monuments render up none of their bones? No reply is as yet possible; we can but collect facts, leaving those who shall come after us the task of drawing conclusions from

them. It is likely, however, that the mere rubbish heaps might, as in civilized cities, have been removed to a distance for sanitary reasons. We must recollect that the ruins of an ordinary town would yield few weapons or implements to an excavator five centuries hence.

The ruins of Kabah and Labná, very near those of Uxmal, deserve a moment's attention. At Kabah a pyramid measuring 180 square feet at the base, and a portico (fig. 134) recalling a Roman structure, rise before the traveller. How did this souvenir of ancient Rome come to be in the midst of a solitude in the New World? And how can we help admiring the marvellous unity of the genius of man, leading him constantly to arrive at identical results? We can never weary of calling attention to this. It is one of the chief interests of our study.¹

The buildings of Labna were no less remarkable than those of Uxmal; but unfortunately they are in a state of extreme decay.² The chief building was covered with stucco ornaments, which are breaking off and rapidly disappearing. One can still make out a row of skulls, some bas-reliefs representing human figures, and a globe of considerable diameter upheld by two men, one of whom is kneeling. All these figures retain some traces of color.

At Zayi, the *Casa Grande* has three stories, each smaller than the one below it; the first measures 265 feet by 120; the second, 220 by 60; the third, 150 by 18. A staircase thirty-two feet wide, and somewhat like those met with in various parts of Yucatan, leads up to the third story.

Chichen-Itza, one of the few towns which has preserved its ancient Maya name, from *chichen*, opening of a well, and *Itza*, one of the chief branches of the Maya race, was a dependency of the Mayapan confederacy. On the destruc-

¹ Stephens, *loc. cit.*, vol. I., p. 398. Baldwin: "Ancient America," New York, 1872, p. 139.

² Stephens, *loc. cit.*, vol. II., p. 16: "The summits of the neighboring hills are capped with gray, broken walls for many miles around." Norman: "Rambles in Yucatan," p. 150.

tion of the latter in the fifteenth century, it managed to maintain its independence, and it was not until two centuries after the conquest, on the 13th of March, 1697, that it was taken by the Spanish and given over to pillage; from this period dates its complete destruction.¹

Over an area of several miles we see nothing but artificial mounds, overturned columns, of which no less than 480 bases have been counted, broken sculptures, rude colonnades, the length of which astonishes us, and masses of rubbish, the last form assumed by the monuments that man, in his pride, thought he had built for eternity. Chichen was one of the chief religious centres of Yucatan; hence its importance and the number and magnificence of its temples and buildings.² Amongst those still standing, we may mention the circus, castle, palace of the nuns, the Caracol or spiral staircase, and the Chichanchob, or the Red house, as they are now called.

The circus was probably nothing but a gymnasium, in which the young men met for trials of strength, skill, and agility. The monument formerly included two parallel pyramids, extending about 350 feet. That on the left, still well preserved, is covered with paintings. These represent processions of warriors or of priests, some carrying weapons; some offerings; they have black beards, and they wear strange head-dresses on their heads, and wide tunics on their shoulders. The colors employed are black, red, yellow, and white. The bas-reliefs are remarkable; all the faces are of the present Yucatan type, and contrast strongly with the pointed heads and retreating foreheads represented at Palenque, and which are said to be still met with amongst the inferior mountain races.

¹ Landa, Bishop of Merida, who died in 1579: "Relacion de las Cosas de Yucatan," p. 340. Friedrickstahl: "Nouv. Annales des Voyages," 1841, p. 300, *et seq.* Stephens: "Yucatan," vol. II., p. 282. Norman: "Rambles in Yucatan," p. 104. Charnay, *l. c.*, p. 339. Baron Friederichstahl visited the ruins in 1840, Stephens and Norman in 1842, Charnay, in 1858.

² "A city which I hazard little in saying must have been one of the largest the world has ever seen." Norman: "Rambles," p. 108.

The palace of the nuns rests upon a base of masonry 32 feet high, and 160 by 112 wide. The building, which is reached by a wide staircase, was two stories high; the walls are ornamented with rich sculptures, similar to those of Uxmal, and the door has an ornamentation of stone turrets, which we cannot better compare than with Chinese or Japanese structures. A protestant missionary, Hardy, has (*"Indian Monachism,"* p. 122) called attention to the resemblance between the buildings of Chichen and the topes or dagobas of the Buddhists.



FIG. 135.—Jamb ornament of a door of the castle at Chichen-Itza.

Inside is a room forty-seven feet long, with walls coated with plaster, on which can be made out, though they have suffered greatly from damp, some men crowned with feathers.

The name of castle has been given to a pyramid the base of which measures 197 feet by 202. Its height is 75 feet, and it ends in a platform reached by a staircase, enclosed by a balustrade, covered with serpents' heads; from this platform rises a building 49 feet by 43, the chief door of which faces northward. The jambs of this door are of stone and

covered with sculptures. We reproduce one of these bas-reliefs (fig. 135), which may give an idea of the face and the head-dress of the inhabitants. The ornament fastened to the nose is particularly characteristic. The internal arrangement, of which the ground-plan (fig. 136) enables us to judge, differs from any thing we have yet noticed.

The Chichanchob,¹ or Red house, (fig. 137) is the best-preserved monument of Chichen. It includes only one dwelling, placed on a pyramid of moderate height, with three doors facing west, lighting a gallery of the same height as the structure. This gallery gives access to three rooms which are only lighted through their doors. Charnay, who mentions this, adds that he has never noticed any windows in the numerous ruins of Yucatan visited by him.

The *Caracol* is a circular building only twenty-two feet in diameter. The inside recalls the estufas met with among the Cliff Dwellers, and consists of a mass of masonry with a very narrow double corridor. The building rises from two artificial terraces placed one upon the other.

The lower terrace, according to Stephens, measures two hundred and twenty-three feet by one hundred and fifty, the upper terrace thirty feet by fifty-five. A flight of twenty steps, forty-five feet in length, leads from the first to the second, and is ornamented with a balustrade which represents interlaced serpents. The serpent plays an important part in the architecture of Chichen-Itza. We meet it at every turn, and it is not difficult to see in it a religious symbol.

We cannot exaggerate the richness of the sculptures; the

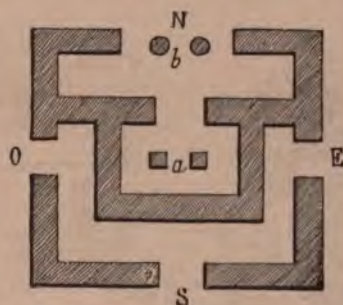


FIG. 136.—Ground plan of the castle of Chichen-Itza. *a*, square pillars in the centre of the principal room. *b*, columns supporting the northern door.

¹We do not know why the Indians give to this building the name of *la Carcel*, the prison.

church built for the Indians is filled with bas-reliefs taken from these ruins. The paintings are even more numerous than the sculptures; everywhere can be made out long processions of men and animals, defiles, battles, struggles between a man and a tiger or a serpent, trees, houses.¹ One of these paintings on the walls of the circus represents a boat somewhat resembling a Chinese junk, and is the only example thus far known of the mode of navigation of these ancient people. Stephens says, speaking of this boat, "that it is the greatest gem of aboriginal art which, on the whole continent of America, now survives."



FIG. 137.—Chichanchob at Chichen-Itza.

Nor are hieroglyphics wanting. In form they resemble those of Copan. Like the latter they are still undeciphered, and we know of but one exception, which we quote with all due reservation, and then only since it has been published by the authority of an important scientific body, the American Antiquarian Society.²

¹ Stephens: "Yucatan," vol. II., pp. 303, 305.

² Salisbury: "The Mayas, the Sources of their History," Worcester, 1877. "Maya Arch.," Worcester, 1879. Short: "North Americans," pp. 396, *et seq.* Letter of Dr. Le Plongeon, of Jan. 15, 1878. Proc. Am. Antiq. Soc., Oct. 21, 1878.

Before relating this discovery it will be well to tell the legend on which it is founded. Chaak Mool, also known under the name of *Balam*, the tiger chief, was one of three brothers who shared between them the government of Yucatan. He had married Kinich Katmò, a woman of marvellous beauty, who inspired Aak, one of her brothers-in-



FIG. 138.—Bas-relief found by Dr. Le Plongeon at Chichen-Itza.

law, with ardent love. This Aak, to obtain her hand, did not hesitate to have her husband assassinated; but Kinich remained faithful to the memory of Chaak, and her conjugal piety led her to have his statue made, and to adorn her palace with paintings representing the chief events in his life and the sad scene of his death. In one of

these paintings Aak holds in his hand three spears, which symbolize the three wounds inflicted on his brother. The Assyrian type is supposed by some to be recognizable in the three personages who are represented three quarters of the size of life. Beside them we see three tall men, with rather small heads, thick lips, and woolly hair, in which some see examples of the negro type.

Dr. Le Plongeon, who visited the ruins of Chichen-Itza in 1875 tells us that he succeeded in deciphering part of the hieroglyphics accompanying the figures; from which he learned that the tomb of Chaak Mool was to be found at a



FIG. 139.—Statue of Chaak Mool, found at Chichen-Itza.

place pointed out, about 435 yards from the palace. Excavations were undertaken, and successively brought to light several bas-reliefs, representing feline animals or birds of prey (fig. 138); a figure in the form of a tiger with a human face; about twenty feet lower down a stone urn, with a terra-cotta lid, filled with ashes which no one seems to have thought of analyzing; and lastly the statue of a man reclining upon a sepulchral stone (fig. 139). The type of the face, the costume, the head-dress, do not resemble those seen, either at Chichen-Itza or in the other towns of Yucatan; and to specify one point only, the sandals are like those

found on the feet of the Guanche mummies of the Canary Islands.

Dr. Le Plongeon was not to reap the fortunate result of his excavations; the Mexican Government took possession of the statue, which is now in the National Museum of Mexico.

This is not an isolated discovery; several similar statues are known, one of which, also part of the collections of the National Museum, was found in Mexico itself¹; another comes from Tlascala; and a smaller Chaak Mool from Merida. This recurrence of the same figure at different places, at a distance from each other, leads us to suppose that it represents not a legendary king of Chichen-Itza, but an as yet unknown divinity. This is Charnay's feeling. "The statue of Yucatan," he tells us, "cannot represent a king, for it is impossible to admit that a king of Yucatan was venerated as a god at Mexico or at Tlascala."²

Many pages would be required to describe all the innumerable ruins covering Yucatan³; worthy of mention is a gigantic head, the *Cara Gigantesca* (fig. 140) which is remarkable for its expression; it is made of a kind of coarse rubble masonry, the blocks of which have been skilfully turned to account by the sculptor in forming the cheeks, mouth, nose, and eyes; the head has been finished in a stucco so hard as to have lasted for centuries. This head is seven feet high. Charnay mentions another, of the same cyclopean character, surrounded by strange ornaments; it is larger than the one we reproduce, being twelve feet high. In a second journey Charnay discovered a bas-relief, which he characterizes as more beautiful than any that have as

¹ Letter from the Rev. John Butler, of the 10th of October, 1878. Butler looks upon the statue found at Mexico as more ancient than those of Chichen; but as he does not give the grounds for his opinion, we cannot do more than quote it. See also Short, *l. c.*, p. 399. *Revue d'Ethnographie*, vol. I., p. 163.

² *Revue d'Ethnographie*, vol. I., p. 167.

³ We should perhaps mention Ake, with its cyclopean walls, made of huge blocks of rough stone, which Stephens, one of the few explorers who have visited them, considers the most ancient ruins of the district. ("Yucatan," vol. I., p. 127.

yet been found. The chief subject, unfortunately damaged, represents a feline animal with a human head, perfectly modelled. On the left of the animal are some grotesque decorations, reminding us of the ornaments of Palenque and Uxmal.¹ The head figured was discovered at Izamal, one of the sacred towns of Yucatan, where Zamna, the companion and disciple of Votan, is said to be buried. According to the accounts of the Indians, the prophet Zamna was buried beneath several pyramids. That on the northeast



FIG. 140.—Cara Gigantesca found at Izamal.

(*Kab-ul*, the industrious hand) contains his right hand. The head is buried beneath the northern pyramid (*Kinich-Kakmo* the sun with rays of fire). The heart is beneath the third, from which now rises a church and Franciscan convent. This pyramid is called *Ppapp-hol-chak*, the house of heads and lightnings.

It is to Zamna that the Yucatecs ascribed all their progress; tradition attributes to him the invention of hieroglyphic writing, and he was the first to teach the people to give a name to men and to things.

¹ Letter from Merida of the 28th, Jan. 1882. *Rev. d'Ethn.*, vol. I., p. 160.

Besides the *Cara Gigantesca*, Izamal possesses several pyramids. One of them is from 700 to 800 feet long, and contains, like the pyramids of Egypt, several chambers; it is considered the most important building in the district.¹ These pyramids are rapidly disappearing; Bishop Landa² counted eleven or twelve at the time of the conquest, and even then the temples crowning them were in ruins.

The accounts of Spanish historians³ leave no doubt of the existence of roads, made for the convenience of travellers, and above all to give access to the religious centres. Some of them extended beyond the limits of Yucatan, and stretched into the neighboring kingdoms of Guatemala, Chiapas, and Tabasco. Some of these roads were paved; such were the *Calzadas* spoken of by Cogolludo and Bishop Landa, which led to Chichen-Itza, Uxmal, Izamal, and to Tihoo, the ruins of which have been used to build the modern town of Merida. These last highways measure from between seven and eight yards in width; they are made of blocks of stone, covered with very well-preserved mortar and a layer of cement about two inches thick. The rivers were spanned by bridges of masonry; Clavigero,⁴ who traversed the whole of Mexico during the last century, speaks of having seen still standing, in many places, the massive piers intended to support them.

We will close what we have to say of the Maya monuments with one general observation: Their number and their dimensions, the taste governing their design and the richness of their ornamentation, strike even the most superficial observer. The progress made by these little known races in ceramic art, the manufacture of textile fabrics and embroidery, and all the technical or industrial arts is not less remarkable.

There is no doubt that, at the time of the arrival of the

¹ Stephens: "Yucatan," vol. II., p. 434.

² "Relacion de las cosas de Yucatan," p. 326.

³ Landa, *I. c.*, p. 344. Cogolludo: "Hist. de Yucatan," p. 193. Charnay:

"Cités et Ruines Américaines," p. 321.

⁴ "Storia antica del Messico," vol. II., p. 371.

Spaniards, the Indians were in some respects superior to the Conquistadores; but the latter had horses and gunpowder, and were, moreover, endowed with a superior energy. The Indians succumbed in an unequal struggle, and rapidly became the prey of the avaricious strangers, incapable even of understanding the culture they were about to destroy.

The buildings erected by the Nahuas were, according to historians, more important than those of the Mayas. We have described the courts of the rulers of Tenotchtlan and Tezcuco: their dwellings probably corresponded with the magnificence of their temples, but have perished. The rage of the Spaniards, irritated as they were by an unexpected resistance, together with the gloomy fanaticism of the priests and monks accompanying the army, were the chief causes of a destruction for ever irreparable. The ruins that still remain standing, sole witnesses of the past, add to our regrets. It would be impossible to describe or even to enumerate them all. We therefore select from them such as may serve as a type of Nahuatl architecture, and best help us to understand the manners and religion of the Nahuas.

The pyramid of Cholula¹ is situated in a miserable village, about ten miles from Puebla de los Angeles. A magnificent temple, dedicated according to some to the sun, according to others to Quetzacoatl, rose from the platform crowning the pyramid, but it was entirely destroyed by Cortes, after a battle which took place at the very foot of the monument. The pyramid still standing measures 1,440 feet square, and covers an area nearly double the extent of that of the great pyramid of Cheops; its height, according to Humboldt, was 177 feet,² and the summit was reached by four successive

¹ Humboldt, "Essai pol. sur le roy. de la Nouvelle Espagne," Paris, 1811, p. 239, and "Vues des Cordillères," Paris, 1816, p. 96. Dupaix: "Prem. Exp." Kingsborough, vol. V. and VI. Jones: "Smith. Cont.," vol. XXII. Clavigero: "St. Ant. del Messico," vol. II., p. 33. Clavigero visited Cholula in 1744; Humboldt, in 1803. Bancroft (vol. IV., p. 471) gives as usual a very complete bibliography.

² Mayer ("Mexico as it Was," p. 26) says 204 feet; Tylor: "Anahuac," 205 feet.

terraces. Here the material employed was no longer dressed stones, as in Yucatan, but adobes about fifteen inches long, similar to those employed by the Pueblo Indians, cemented with a very hard mortar mixed with little stones and even fragments of pottery. A German traveller¹ adds that the four faces were coated with a cement similar to that in use at the present day.

Excavations have shown the regularity of the building, and have brought to light a tomb of slabs of stones, supported by posts of cedar wood. Two skeletons rested in this tomb, and beside them lay two basalt figures, various ornaments of little value, and some fragments of pottery. The pyramid of Cholula may therefore have been a tomb; but if so, its ostentatious structure was as powerless here as in Egypt to preserve the bones of its inmates from the profanation so much dreaded. There are, however, some doubts as to the purpose of the pyramid. The skeletons were not placed in the centre of the monument, into which the explorers were not able to enter. It has therefore been supposed that they were those of slaves, killed at the time of the erection of the monuments. M. Bandelier looks upon the buildings of Cholula as having been chiefly defensive works.²

According to certain legends, of which traces are met with amongst the natives, this pyramid was erected in expectation of a fresh deluge. Father Duran gives another version³; that men, dazzled by the glory of the sun, had tried to erect a structure which should reach up to the firmament; the inhabitants of heaven, indignant at such audacity, destroyed the building and dispersed the builders.

Historic data are neither more serious nor more precise than legends. The dates of the erection of the pyramids vary from the seventh to the tenth century of our era. Cholula was then an important town in the power of the

¹ Heller: "Reisen in Mexiko," Leipzig, 1853, p. 131.

² "Arch. Hist. of America," Nov., 1881.

³ "Hist. Ant. de la Nueva España," vol. I., chap. I. (The history was written about 1585.)

Toltecs, so that it is to them that the building under notice must be due.

Xochicalco, seventy-five miles northwest of Mexico, is certainly one of the most peculiar monuments of the province.¹

In the centre of the plain rises a conical eminence, the base of which, of oval form, is two miles in circumference and the height of which is variously estimated at from 300 to 400 feet. Two tunnels, pierced in the flank of the hill, open on the north; the first has been penetrated for a distance of eighty-two feet, where the explorers were obliged to turn back. The second tunnel pierces the calcareous mass of the hill, as a gallery nine feet and a half high, which extends by various branches to a length of several hundred feet. A pavement, no less than a foot and a half thick, covers the ground; the sides are strengthened with walls of masonry, wherever such works are necessary, then coated with cement and painted with red ochre. The principal gallery leads to a room measuring eighty feet, and the architects' practical knowledge of their art was such that they were able to contrive two piers to give more solidity to the roof. In one of the corners of the room opens a little rotunda, six feet in diameter, excavated, as is the room itself, in the rock, and of which the dome, in the form of a pointed arch, greatly struck the first explorers, who were not at all prepared to find in the heart of Mexico a specimen of Gothic art.

The whole of the outside of the hill is covered with a revetment of masonry, forming five successive terraces, seventy feet high, upheld by walls crowned with parapets. Dupaix relates that the summit was reached by a path eight

¹ Alzate y Ramirez visited Xochicalco in 1777, and, in 1791, published a very inexact account of his discoveries, under the title of "*Descripcion de las Antigüedades de Xochicalco.*" Dupaix and Castañeda visited the ruins in 1831, and the *Revista Mexicana* (vol. I., p. 539) gives the result of a more recent exploration, made at the cost of the Mexican Government. Lastly, among other explorers, we name: Humboldt, "*Vues des Cordillères.*" vol. I., p. 98. Tylor: "*Anahuac,*" p. 189. Nebel: "*Viaje pittoresco y arqueologico sobre la rep. Mejicana.*"

feet wide. The platform measures three hundred and twenty-eight feet by two hundred and eighty-five. A temple (fig. 141) measuring sixty-five feet from east to west, and fifty-eight from north to south, rose from this platform, in honor of an unknown god; the building, which was of rectangular form, was constructed of blocks of porphyritic granite,¹ laid without mortar, and with such art that the joints are scarcely visible. It is impossible to estimate the



FIG. 141.—Ruins of the temple of Xochicalco, Mexico.

labor required to take these blocks from a distant quarry and place them at the height they occupy.

In 1755 there were five stories, one behind the other, to the temple; it was crowned by a stone which could be used as a seat, and which was covered, as was the rest of the building, with an ornamentation which must have been as difficult to

¹ "Porfirdo granítico," *Revista Mex.*, vol. I., p. 548. "Basalto porfirico," Nebel. "Basalt," Lowenstern, Mex., p. 209. "La calidad de piedra de esta magnífica arquitectura est de piedra vitrificabile," Alzate, *l. c.*, p. 8.

execute as it is to describe. An unfortunately very inexact model on reduced scale of this monument figured in the international exhibition of 1867. It was reproduced in the *Illustrated London News*, of June 1, 1867. It is fair to add that the destruction of Xochicalco is not to be imputed to the Spaniards; the author of this act of vandalism was a neighboring land-holder, who wanted to use the stone for building a factory.

The long wars which desolated Anahuac, and which were in truth, the normal state of the country, had led to the erection of vast defensive works, and traces of these fortifications have been made out at Huatusco, in the province of Vera Cruz, whence they stretched for a very great distance northward. Centla appears to have been one of the chief for-



FIG. 142.—Pyramid at Centla.

tified places; ruins cover the plain; but they are gradually disappearing, destroyed by the inhabitants. A neighboring forest hides several pyramids, which, thanks to its protection, have remained standing.¹ We reproduce one of them, which may serve as a type (fig. 142). The walls are of dressed stone, cemented with lime mortar; but lime was doubtless costly, and all the inside of the walls is of rubble, laid in clay. Niches are prepared in various places to receive statues, or symbols of the protective deities.

These pyramids are certainly the most striking examples of ancient American architecture. It is from truncated pyramids that the teocallis or palaces rise at Palenque as at Copan, in Yucatan and Honduras as in Anahuac; the trav-

¹ Sartorius, "Soc. Mex. Geog. Boletin, 2 a epoca," vol. I., p. 821; vol. II., p. 148.

eller meets with them as far as the Isthmus of Tehuantepec, where two of them near the town of Tehuantepec are especially noticeable; the larger measures one hundred and twenty feet by fifty-five at the base, and sixty-six by thirty at the platform crowning it; a staircase no less than thirty feet wide leads to this platform.

Local differences may be observed, the cause of which is most often the difference of the materials at the disposal of the builders; but everywhere the primitive type is retained, a development connecting itself with the mounds, which occur from the borders of the Ohio and the Mississippi into Florida, and thence into more southern regions, where they remain last witnesses of the migrations of these races.

Such are the chief ruins that recall the Nahuas. The carelessness, the fanaticism, and the avarice of the conquerors have rapidly destroyed monuments the magnificence of which is alleged to have dazzled the Spaniards. These monuments may be judged by our description of a few of them, but it is probable that the exuberance of Spanish adjectives and the natural tendency of travellers to exaggerate the features of their discoveries are responsible for much that has passed into history.

Tula,¹ the former capital of the Toltecs, is now represented by a poor and miserable village, thirty miles to the north-west of Mexico. Of its past grandeur it has preserved nothing but its name. "Five centuries before the conquest," says Sahagun,² "this great and celebrated town shared the adverse fortunes of Troy." The ruins that existed have in their turn disappeared, and excavations executed in 1873 yielded nothing but a monstrous idol and two basalt columns. One of these (fig. 143), covered with ornaments finely exe-

¹ There are several places of the name of Tula, Tulha, and Tulau; hence a serious difficulty. ("Popol.-Vuh, pp. LXXXV. and CCLIV.) Tula was, it is said, destroyed by the Chichimecs in 1064, and the inhabitants took refuge at Cholulan, the *city of exiles*. The latter town in its turn rose to importance rapidly, for the Spaniards, we are told, gave it the name of Rome on account of the splendor of its monuments.

² "Hist. de la cosas de Nueva España," prol. al. lib. VIII.

cuted, is interesting, as it shows us the mode of jointing with tenon and mortice employed by these people, who were already well advanced in their knowledge of technical processes.¹ Other ruins of little importance are met with in the neighborhood; but we learn nothing about the ancient Tula. Such was the state of things when recent discoveries revealed facts which, should they be confirmed, will prove of capital importance to the ancient history of America.

Charnay, in the execution of a mission entrusted to him by the French Government, went to Zula and superintended the excavation of some tumuli, mountains of rubbish probably, which had covered for many centuries the relics of the ancient Toltecs. One dwelling thus exhumed consisted of twenty-four rooms, two cisterns, twelve corridors, and fifteen little staircases "of extraordinary architecture and thrilling interest," enthusiastically exclaims the fortunate explorer.²

"This is not all," he adds; "in the midst of fragments of pottery of all kinds, from the coarsest used in building, such as bricks, tiles, water-pipes, to the most delicate for domestic use, I have picked up enamels, fragments of crockery and porcelain, and more extraordinary still, the neck of a glass bottle iridescent like ancient Roman glass."

Amongst the débris lay the bones of some gigantic ruminants (perhaps bisons?), the tibia of which were about one foot three inches long by four inches thick,



FIG. 143.—Column from Tula.

¹ "Soc. Mex. Geog. Boletin," 3d epoca, vol. I., p. 185. "The Toltecs used indifferently stones mixed in mud or in mortar for the interior of the walls, and cement and lime for coating them. They employed burnt brick and hewn stone for the inside coating, brick and stone for the stairs, and wood for the roofs. They were acquainted with the pilaster, which we have found in their houses; with the engaged column, caryatides, and the free column, and we can think of few architectural devices that they did not know and use." Charnay, "Bull. Soc. Geog.," Nov., 1881.

² Letter to the *Trait d'Union* of the 28th of August, 1880. "Archives des Missions scientifiques," vol. VII.

the femur at the upper end about six inches by four inches.

Admitting that there is no mistake, these facts are absolutely new, for previously it was considered that the early Americans did not know how to make either glass or porcelain, and that before the arrival of the Conquistadors none of our domestic animals were known in America, but that the oxen, horses, and sheep living there at the present day are all descended from ancestors imported from Europe.

The excavations have also yielded some little chariots that Charnay thinks were the toys of children. Now, supposing these toys to have been a reproduction in miniature of objects used by men, we must conclude that the Toltecs employed carriages, and that their use was not only given up, but absolutely unknown on the arrival of Cortes.¹

These discoveries, we can but repeat, greatly modify the conclusions hitherto accepted. But are these really original productions? May they not have been imported? This is after all doubtful, and new proofs are needed to establish certainly that the objects discovered really date from the pre-Columbian period before we can admit that in the eleventh century the Toltecs possessed domestic animals, that they knew how to make and fashion porcelain, glass, perhaps even iron, for Charnay also collected in his excavations several iron implements. He himself expresses an idea that the material of which they were made dates from the Spanish period. He does not explain why he makes an exception on this point with regard to the glass and porcelain objects.

It is strong evidence against their prehistoric character that all these elements of an advanced civilization must have disappeared without leaving any trace even in the memory of man. It is probable, therefore, that the different objects brought to light by Charnay are later than the Spanish conquest, and it will be wise to reserve our opinion with regard to them until more complete information can be obtained.

¹ *Revue des Questions scientifiques*, Oct., 1881, p. 640.

No monument of Mexico has remained standing; there is nothing to recall the power of the Aztecs; pyramids, palaces, teocallis, all have disappeared; the ruins themselves are buried beneath the accumulated dust of three centuries; and we are ignorant of the very position of the edifices over the grandeur of which Spanish writers expatiate.¹ To get some idea of what were the buildings of the Aztecs, we must reproduce the description of the great temple erected by Ahiut Zotl in honor of the god Huitzilopochtli.

This temple occupied the centre of the town; it was situated in the middle of an enclosure surrounded with walls which extended for a length of 4,800 feet. These were built in rubble-stone laid in mortar, coated with plaster, polished on both faces, surrounded by turrets and machicolations of spiral form, and ornamented with numerous sculptures, chiefly representing serpents. Hence the name by which they were known, Coetpantli, or walls of serpents.² On each side was a building, the lowest story of which served as a portal to the interior of the court.

On entering one found one's self opposite the great temple, which formed a regular parallelogram of three hundred and seventy-five feet by three hundred, and which like the other teocallis rose in five terraces, each built smaller than the other below it. The walls were of rubble, mixed with clay and beaten earth, covered with large slabs of stone carefully cemented and encased by a thick coating of gypsum. The upper platform, which was reached by a flight of three hundred and forty steps, passed round each of the terraces in succession, and was surmounted by two towers

¹ Bernal Diaz: "Hist. verdadera de la Conquista de la Nueva España," fol. 70.; "Relatione fatta per un gentil'huomo del signor F. Cortese." Ramusio: "Navigationi et Viaggi," vol. III., fols. 307, 309. Torquemada: "Mon. Ind.," vol. II., p. 197. Cortes: "Cartas y Relaciones," p. 106. Sahagun: "Hist. Gen.," vol. I., p. 197. Gomara: "Hist. de Mex.," fol. 118. Las Casas: "Hist. Apol.," chs. XLIX., LI., CXXIV. Tezozomoc: "Hist. Mex.," vol. I., p. 151. Amongst modern writers may be consulted Prescott's "Hist. of the Conquest of Mexico" and Tylor's "Anahuac."

² "Era labrada de piedras grandes a manera de culebras asidas las unas a las otras." Acosta: "Hist. de las Yndias," p. 333.

of three stories each, their total height being fifty-six feet. The two upper stories were of exceptional construction, being in wood, and could only be reached by means of ladders. The roof was also of wood, and consisted of a cupola upheld by columns painted alternately black and red.

The sanctuaries of the gods were in the lower story of the *teocalli*; on the right was that of *Huitzilopochtli*, and on the left that of his half brother *Tezcatlipoca*. The statue of the former was exhumed almost intact in 1790; the Indians hastened to cover it with flowers. This is a strange fact, especially when we contrast it with the indifference to the past noticed among the present Indians of North America. The gigantic statues of *Huitzilopochtli* and *Tezcatlipoca* were hidden from the eyes of the faithful by magnificent draperies, and at their feet was set up the sacrificial stone, said by *Clavigero* to have been of green jasper, on which so many unfortunate victims perished. *Las Casas* is enthusiastic even to exaggeration over the internal richness of the temple. *Bernal Diaz*, who is probably more veracious, says that the walls and the floors were streaming with human blood, and exhaled an odor so fetid that the visitors were quickly put to flight.¹ In all the temples and before all the idols burned the sacred fire, which was always scrupulously kept up, for its extinction threatened the country with great danger. From the top of the principal *teocalli* could be counted six hundred braziers, which were burning day and night.

Forty smaller temples, mostly crowning pyramids, rose from different points of the sacred enclosure, like satellites of the greater gods to whom the chief temple was consecrated. That of *Tlatoc* was reached by a flight of fifty steps²; that of *Quetzacoatl* was circular and crowned by a dome; the door was low, and represented the mouth of a serpent; the worshippers who came to adore their god had to pass through this half-open mouth which seemed ready

¹ "Hist. de la Conq.," fol. 7.

² Oviedo: "Hist. Gen. y Nat. de las Indias," vol. III., p. 302.

to devour them.¹ The *Ilhuicatlican* was dedicated to the planet Venus, and a captive had to be sacrificed at the very moment of the appearance of that planet above the horizon. In accordance with a rather original idea an immense cage was placed in one of the *teocallis* to receive the statues of foreign gods, so that they might not be able to use their liberty for succoring their worshippers.²

The *Quauhxicalco* was an immense ossuary where the bones of victims were accumulated. The skulls were set aside and put in the *Tzempantli* outside the enclosure near the western gate. This *Tzempantli* was an immense oblong pyramid formed by human heads enshrined in the masonry. Two columns dominated the platform of the pyramid, and these columns were entirely composed of heads taking the place of stones.³ When the victim was a chief the head was set up in its natural condition, and nothing could exceed the horror and disgust inspired by these grinning dead faces. The Spaniards alleged that there were as many as one hundred and thirty-six thousand of these heads thus exposed.

The court was the largest portion of the enclosure. It was here that an immense crowd collected to assist at the sacrifice and at the combats of the gladiators. Here, too, were the lodgings of thousands of priests, women, and children, whose duty it was to take care of the temples and the sacred precincts; according to Bernal Diaz, however great the number of visitors, the enclosure was kept clean with such care that it would be impossible to discover in it so much as a single straw.

Tezcuco has disappeared like its ancient and eager rival; its stones, bas-reliefs, and sculptures have been used to build the houses of the modern town, and a few heaps of now shapeless adobes and rubbish of all kinds here and there are the sole mementoes at the present day of the past splendor

¹Torquemada: "Mon. Ind.," vol. II., p. 145.

²Torquemada, quoted above, vol. II., p. 147.

³Warden: "Recherches sur les Ant. de l'Am. du Nord., Ant. Mex.," vol. II., p. 66.

of a town which contained one hundred and forty thousand houses, and where two hundred thousand craftsmen worked for years at the erection of the dwelling of the chief.¹ Tylor, in a recent visit, made out the foundations of two large Teocallis and several tumuli, which marked ancient graves. In consequence of one of these geological phenomena which it is difficult to explain satisfactorily, but which are met with in every part of the globe, the lake which once washed the capital of the Tezcucans is now several miles from the modern town.

In spite of our wish to abridge a necessarily very dry list of names, it is impossible to omit noticing the ruins of Quemada, in the south of Zacatecas, on the road between the town of that name and Villanueva, not only on account of the mass of ruins which cover a considerable area and bear witness to the ancient importance of the town, but also because of the differences between its buildings and any of those of which we have hitherto spoken.

The origin of Quemada is unknown, but it has been stated, without any serious proof, that the Aztecs halted there in their migrations southward, and that it is to them that the town, the true name of which is unknown, owes its foundation.²

The *Cerro de los Edificios* is an irregular hill, half a mile long and from six hundred to nine hundred feet wide, which suddenly rises to the height of about sixteen hundred feet, near its summit. This was a fortress, a regular intrenched camp, surrounded with walls no less than twelve feet thick, with several tiers of bastions connected by curtains. A large

¹ Torquemada: "Mon. Ind.," vol. I., p. 304. The figures he gives are probably greatly exaggerated. Peter Martyr only speaks of twenty thousand houses, and Cabajal Espinosa of thirty thousand, "Hist. de Mexico," Mexico, 1862, vol. I., p. 87.

² Lyon: "Journal of a tour in the Republic of Mexico," London, 1828, vol. I., p. 225. Narcos de Esparza: "Informe presentado al Gobierno," Zacatecas, 1830. J. Burkart: "Aufenthal und Reisen in Mexico," Stuttgart, 1836. Nebel: "Viage sobre la Republica Mejicana," Paris, 1839. "Soc. Mex. Geog. Bol.," 2a. epoca, vol. III., p. 278. Fégueux: "Les Ruines de la Quemada," *Rev. d' Ethn.*, vol. I, p. 119.

pyramid about thirty-two feet high, forms a veritable redoubt.

It is at *Los Edificios*, as the name implies, that the most important ruins are found. It is impossible to describe them, for they are now, as we have said, nothing but masses of rubbish; and long and costly excavations alone could enable us to judge of the form and purpose of the various buildings. Several columns have remained standing, and the position of some of them indicate that they had formed part of porticos. This is an exceptional fact in ancient American architecture. These columns are in gray porphyry, and remind us of the massive ones of Egyptian temples. One of these columns is no less than nineteen feet in circumference, and eighteen feet high. Fégueux speaks of eleven columns of about three feet in diameter and nine in height.

Besides the pyramid we have mentioned, there are several others belonging to this well-known type. The mortar which binds the stones together is, as in the buildings of the Mound Builders, a mixture of clay and straw. So far none of the sculptures, hieroglyphics, or pictographs, such as are so constantly met with in other ancient towns, have been found. Fégueux, however, speaks of a stone on which five serpents were engraved, situated at the foot of the escarpment of *Los Edificios*.

The plain surrounding the Cerro is covered with ruins, amongst which neither pottery, flint weapons, nor implements are found. We are met with the strange problem of a town, every thing about which proves its importance, yet where nothing of this sort reveals the presence of man.

The province of Oajaca, situated on the banks of the Pacific and crossed by the Cordillera, includes a mountainous and sterile region overlooking the *tierras calientes* with their rich tropical vegetation; here dwelt the Zapotecs,¹ who

¹ Maler writes Tzapoteques (*Nature*, 25th Dec., 1880). Perhaps he is right, for the name seems to be derived from *Tzapotl*, "a well-known fruit," says Molina, "Vocabularis en lengua Castellana y Mexicana." They called themselves *Didsasa*.

resembled the Mayas in their language,¹ and the Nahuas in their religious rites and in the style of their architecture; springing very probably from intermarriages between these two races. The men were strong and well built, brave and often ferocious²; the expression of their faces was disagreeable; whilst the women, on the contrary, are said to have been pretty, with finely cut and delicate features.

Their religious rites, as we have just said, resembled those of the Aztecs. Among their numerous divinities, patrons of all the virtues and also of all the vices, they recognized one principal God, *Piyexoo*; the uncreated being, *Pitao-Cozaana*, the Creator. What is more certain is that, like the Aztecs, they did honor to their gods by human sacrifices. Men were offered up on the altars of the gods, women on those of the goddesses. On the day dedicated to Teteionan,³ a woman, who was seated on the shoulders of another woman, had her head cut off; and her bearer had to appear before the goddess bathed in the blood which flowed. At the celebration of a holiday in honor of the arrival of the gods, the victims were burned, and on other occasions children were drowned or walled up in caves, there to die slowly of the cruel tortures of hunger and fear.⁴

The Zapotecs were subject to a chief, and the office was hereditary. Contemporary with this chief lived a chief priest, the *Weyetao*, who resided at Yopaa, and took an important part in the government of the country. His feet were never allowed to touch the ground; he was carried on the shoulders of his attendants; and when he appeared, all, even the chiefs themselves, had to prostrate themselves before him, and none dared to raise their eyes in his presence.

¹ Bancroft (vol. III., p. 754) gives very fairly complete details on this language, and mentions his authorities.

² "Ferozes y valientes," says Burgoa, "Geog. Descr.," vol. I., p. 2, fol. 196, vol. II., fol. 362. Herrera: "Hist. Gen.," vol. III., dec. III., book III., CXIV.

³ A goddess adored by the various people of the Nahuatl race, also known under the names of *Tozi*, *Toccy* and *Tocitzin*.

⁴ Clavigero, "St. Ant. del Messico," vol. II., p. 45.

The Weyetao could not marry, and was bound to continence, but on a certain day of the year he had a right to become intoxicated, and when he was in that state, a young and beautiful virgin was brought to him; and it was the eldest of the children born of this union of a single day who inherited the sacerdotal dignity.¹

The splendor of the edifices erected by the Zapotecs was by no means inferior to that of the other people of Central America, and Mitla,² their capital and sacred town, was in every respect worthy of comparison with Palenque or Uxmal, Chichen-Itza or Tenotchitlan. It is said to have been founded by the disciples of Quetzacoatl, and a legend tells that one day an old man of venerable aspect suddenly came out of Lake Huixa, accompanied by a young girl of incomparable beauty. This old man was clothed in a dress and mantle of brilliant blue, and wore a mitre on his head. He pointed out an eminence, on which a temple was built under his orders; he gave to the country wise and just laws, and disappeared as mysteriously as he had arrived.³ But a town had already risen near the temple, and for centuries this town continued to prosper, thanks to the celestial protection. There are vast gaps in its history, and a few very doubtful facts are just beginning to accumulate. We know that the Zapotecs were engaged in long struggles with the Aztecs, and that, at the end of the 15th century, about 1494, Mitla was taken and given over to pillage, the priests who had conducted the defence being taken to Mexico, and offered up on the altars of Huitzilopochtli.

The town of Mitla rises in the centre of a narrow and dusty valley, framed in dreary and rugged mountains. Its ruins appear suddenly before the traveller, and their mag-

¹ Burgoa, *loc. cit.* Brasseur de Bourbourg: "Hist. des Nat. Civ.," vol. III., p. 29.

² The Zapotec name was *Lioba* or *Yobba*, the town of tombs; the name of Mitla seems to have been given by the Aztecs. It may come from *Mictlan*, the abode of souls after death; or from *Mitl*, one of the Nahuatl gods.

³ Torquemada, vol. I., p. 255. Herrera, dec. III., book II., ch. XI. Veytia, vol. I., p. 164. Burgoa, fol. 297, 343.

nificence contrasts strangely with the arid and desert country surrounding them. "The monuments of the golden age of Greece and of Rome," says the eminent archeologist, Viollet-le-Duc, "alone equal the beauty of the masonry of this great building. The facings, dressed with perfect regularity, the well-cut joints, the faultless bends, and the edges of unequalled sharpness, bear witness to knowledge and long experience on the part of the builders."

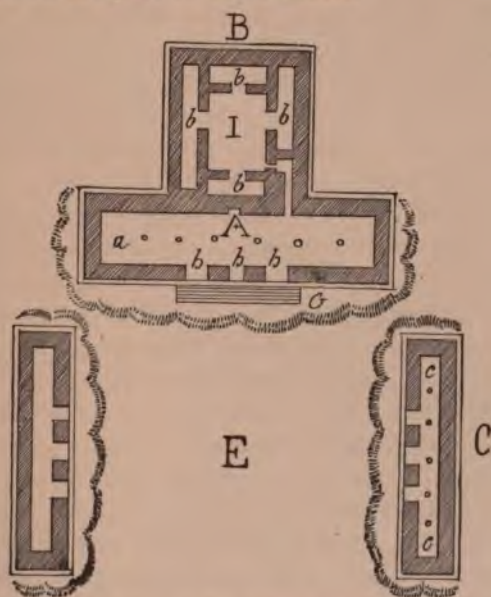


FIG. 144.—Plan of the great temple of Mitla.

The most remarkable building of Mitla is the palace, lauded in such enthusiastic terms; it consists of an interior quadrangle measuring 130 by 120 feet, surrounded on three sides¹ by rounded mounds, from which rise important buildings (fig. 144). The northern building (A) is well preserved; of that on the east (C) nothing remains but a few crumbled walls, in the midst of which rise a portico and

¹ On the plan given by Dupaix he figures a fourth building. Viollet-le-Duc reproduces it (p. 75). The very foundations have now completely disappeared.

two columns (*e.*, *c.*). The western building (D) has fared still worse; its foundations alone remain. At Palenque the walls were entirely constructed of dressed stones; in Yucatan, dressings of large stones mask a heart of rubble-stone and mortar; it is this latter mode which was employed at Mitla; but the mortar is replaced by clay, and the exterior face is formed in masonry consisting of perfectly hewn stones, of the size of a small brick, producing many varied combinations by their joint patterns and zig-zags.

The lateral buildings measure 96 feet by 17; that on the north 130 by 36. Several steps (G.) lead up to three doors (*h.*) and give access to them. The lintels are no longer in wood, but in large stones, such as those in the monuments of Greece or Rome.

The chief room (fig. 145) was ornamented by six columns, without plinth and without capital. These columns were probably intended to uphold the roof, and thus to lessen the bearing of the beams.¹ Humboldt, who visited these ruins in 1802, speaks of large beams; Dupaix says they were of the wood of a coniferous tree; such was also the opinion of Viollet-le-Duc; and Maler reports that at the time of his visit all the beams had disappeared. Burgoa, on the contrary, speaks of having seen in their places large slabs more than two feet thick, resting on pillars nine feet high, and the Abbe Brasseur de Bourbourg² confirms this fact, adding that all round the building ran a cornice ornamented with grotesque sculptures, the whole of which formed a kind of diadem crowning the building. We have taken pains to relate these unimportant details, to illustrate the impossibility of coming to any conclusions in the presence of facts so very obscure in themselves and rendered yet more confusing by the discrepancy of different explorers.

The walls and the pavement had been covered with three

¹ Similar examples might be mentioned in certain pueblos, undoubtedly of more recent construction than the palace of Mitla, at Tuloom, on the eastern coast of Yucatan.

² "Hist. des Nat. Civ.," vol. III., p. 26.



FIG. 145.—Chief room of the palace of Mitla.

layers of very durable stucco, painted red, of a tone not unlike that decorating the walls of Pompeii.

From the room of the columns a very dark lobby led into a second court (I.), surrounded by rooms (*b.*, *b.*), which, in spite of their small dimensions, must have been the chief ones of the palace. The richness of their ornamentation was remarkable; the walls were covered with a regular mosaic in little stones, forming symmetrical designs, Greek frets, or arabesques. It is difficult to decide whether these mosaics, of very skilful execution, bear witness to an art more advanced than that of the sculptures at Uxmal, it is yet more difficult to assign a date to the building of either. It is however, pretty generally agreed that the monuments of Uxmal are more ancient than those of Mitla.

The three other palaces, the ruins of which are standing, must be briefly mentioned. They resemble, though on a smaller scale, the one already noticed. Probably hieratic influence consecrated a type from which none were allowed to depart; everywhere we meet with the mosaics in stone, which are characteristic of the architecture of Mitla. We will only mention a subterranean gallery in the form of a cross, under one of these palaces. Crypts are in fact rare in Central America.

The Zapotecs had carried their conquests as far as the isthmus of Tehuantepec, and it is probably to them that are due the pyramids still standing in several places, such as the fortifications of Cerro de Guiengola,¹ of which we have already had occasion to speak. These fortifications were erected after the taking of Mitla, by order of Cociyoeza; they enabled the Zapotecs to make a victorious resistance, the result of which was an honorable peace for the vanquished. A sepulchre hewn in the very side of the Cerro has yielded more than two hundred pieces of pottery, chiefly vases or little figures of animals. The whole of the inside of the tomb was covered with a thick coating of cement, and the

¹ Arias: "Antigüedades Zapotecas," Museo Mex. Müller: "Reisen in den Vereinigten Staaten, Canada, und Mexico," Leipzig, 1864.

corpses were placed with the faces turned toward the ground, a very unusual arrangement.

The Cerro de Guiengola is but a few leagues from Te-



FIG. 146.—Image of a Zapotec chief.



FIG. 147.—Zapotec ornament found at Tehuantepec.

huantepec, the capital of the province, where the recent discovery of the sepulchre of one of the ancient chiefs of the country is announced.¹

¹F. Maler, *Nature*, 14th June, 1879.

In 1875, in demolishing a house, the workmen found a number of costly jewels of gold, together with several human skeletons which fell to dust immediately on contact with the air. This tomb was completely unknown at the time of the Spanish conquest, or it would certainly not have escaped the rapacity of the Spaniards. This last fact, taken with the state of the bones, justifies us in assigning great antiquity to the sepulchre, and adds to the value of the discovery. Unfortunately the jewels were sold for the weight of the gold, and nearly all were immediately melted down. The only ones left are those we reproduce (figs. 146 to 149). One of them is supposed to be the image of a Zapotec chief, placed near his corpse; the bird seems to have been a labret or pendant for the lip. A similar ornament is fastened to the royal lip. Several little figures represented turtles; they are all made in a single piece, hollowed, without a trace of soldering, and such as the most skilful jewelers of our present day would find it very difficult to imitate.

With the gold ornaments were also picked up several copper objects, earthenware vases of graceful form, a cup, the handle of which represents the paw of a feline animal, others ornamented with tastefully executed paintings, and lastly some necklaces of round stones and bracelets of sea-shells. At previous times several little earthenware figures had been found, which are now in the National Museum of Mexico. These discoveries, together with the monuments, or rather the ruins still existing, bear witness to the industry of the Zapotecs.

We are obliged to omit numerous ruins, temples or palaces, mounds, pyramids or fortifications. Central America, from the Mississippi to the Isthmus of Panama, is literally covered with them, and that in the most different regions; from fertile plains, where men can live in large numbers, to arid mountains, where it is scarcely possible to maintain existence. It is impossible, however great their interest, to describe all these discoveries; our sole aim is to illustrate the riches, the luxury, and the culture of these people, the

very name of which is almost effaced from the memory of men.

Under these circumstances there is but one other fact to which it will be useful to call attention. Santa Lucia Cosumhualpa, in the department of Escuintla (Guatemala), a little town of recent creation, not yet marked on any map, rises at the foot of the volcano del Fuego. The celebrated



FIG. 148.—Zapotec ornament found at Tehuantepec.



FIG. 149.—Zapotec labret.

German traveller, Bastian, who crossed the country in 1876, has proved the existence all around the village of important ruins, the greater number of which are, however, still hidden in the midst of impenetrable forests.¹

¹ Habel : "Investigations in Central and South America," "Smith. Cont.," vol. XXII. Schobel : "Un chap. de l'Arch. Am. Congres de Luxembourg," vol. II.

Amongst blocks of cyclopean stone, and rubbish of all kinds, sculptures are seen, differing materially from and infinitely superior to those we have described.

In the sugar plantation of Don Manuel Herrera, Bastian saw colossal heads in stone, of a strange and unknown type, and several figures of animals, such as tapirs and alligators. These gigantic statues were arranged in threes, at equal distances from each other, as if they had marked a colonnade now destroyed. At the Hacienda de los Taros lay three other figures in relief, five feet nine inches in height, by three feet seven inches across, and of bold execution. Two of these figures wore earrings, and their head-dresses resembled the Asiatic turban.

Farther on are some bas-reliefs, sculptured in very hard porphyritic rocks, such as are only found near the volcano of Acatenango, so that the blocks must have been brought from a great distance. These huge bas-reliefs represent figures grotesque alike in design and execution, and mythological scenes perfectly unlike those with which we are acquainted either in Maya or Nahuatl art. Several of these scenes represent the adoration of the sun and of the moon, or rather of the gods presiding over these heavenly bodies, for men had already adopted anthropomorphism and endowed their gods with the human form. The priests and worshippers are naked; but the ornaments and jewels with which they are loaded are full of interest. Farther on a chief is seated on his throne, with the ear distended by a ring of considerable size and weight; an interesting fact, for we meet again with this same barbarous custom imposed by the Incas upon the inhabitants of Peru, and the Mound Builders wore large copper rings in the ears. The most interesting bas-relief represents a human sacrifice (fig. 151); the principal personage is a priest, wearing the strange head-dress of a crab, holding in his right hand a flint, probably the sacrificial knife, and in his left hand the head of the victim whom he has just killed. Beneath are two figures, each carrying a human head. One doubtless represents Death, for

his face is that of a skeleton; he is girded with two serpents, and the form of his head is like that of an ape. The cut-off heads appear to have belonged to a different race from the priest or his assistant.

The bodies are nude and of correct proportions; ornaments are arranged so as to hide the sexual organs; the feet are shod with sandals, and the features express satisfaction. Lastly, it is the head of the victim, not the heart as was the invariable custom of the *Áztecs*, which was being presented to the gods.

The sculptures found at Santa Lucia are by no means



FIG. 150.—Stone head found near Santa Lucia.

exceptional. The whole of Guatemala, that ancient land of the Quichés and Cakchiquels, is covered with ruins, among which are bas-reliefs, statues and monoliths, some attaining twenty-five feet in height, and including numerous representations of men and animals. At Quirigua especially, on the Rio Motagua, about eight miles from Ysabal, a little port on the Gulf of Honduras, have been discovered a colossal head, and a statue of a woman with feet and hands missing, wearing on her head a crowned idol; while, close by, excavations have yielded the head of a tiger in porphy-



FIG. 151.—Human Sacrifice ; bas-relief from Sta. Lucía.

ritic rock; the terror that this great feline animal inspired doubtless led to its being admitted to the rank of a god.¹ An altar, on one of the sides of which a turtle has been sculptured, and lastly an idol, twenty-three feet high, also deserve to be mentioned. All these figures are menacing or repulsive; human bodies are surmounted by the heads of apes. Unlike the immortal creators of art in Greece, the early Americans did not seek beauty, or rather they did not understand it, and their conceptions could not therefore be of equal elevation.

What justly surprises us is the immense amount of work required in these sculptures, with such mechanical processes as alone appear to have been known. First of all, blocks of hard stone had to be got out with wretched implements of quartz or obsidian; and then the granite or porphyry had to be sawn into slabs with agave-fibre and emery.² A rough drawing of the outline indicated where the thickness was to be reduced, and this work was executed either by sawing a certain portion, which was immediately skilfully chipped, or by hammering with a flint point; lastly, with the help of flat stones or polishers and of water mixed with emery, the surface of the plane portions was rubbed so as to remove all traces of the work. These processes were long, and necessarily required great patience on the part of the workmen to obtain the desired results. This is a certain indication of a society in its infancy, where men had not yet learned to recognize the value of time.

We have spoken of the engravings on rock and hieroglyphics met with in the region occupied by the Cliff Dwellers and the inhabitants of the pueblos. We meet with similar engravings and similar hieroglyphics throughout Central America. The desire of perpetuating the memory of the objects before his eyes by imitating them is one of the

¹ Stephens: "Central America," vol. II., p. 188. Scherzer: "Ein Besuch bei den Ruinen von Quirigua im Staate Guatemala," Vienna, 1865.

² Soldi: "Les camées et les pierres gravées l'art au moyen âge, l'art Khmer, les arts du Pérou et du Mexique, l'art Egyptien, les arts industriels, des musées du Trocadero," Paris, 1880.

most characteristic peculiarities of man. In Honduras is a rock covered, as to a great part of its surface, by figures of men, animals, and plants, engraved in *taglio* to a depth of more than two inches, and Pinart describes in the State of Panama cliffs entirely covered with hieroglyphics, which he tells us are full of interest for the student.

In Mexico there are paintings, which are regular annals of the people, and represent their first migrations. Bancroft (vol. II., pp. 544, 545, 547) reproduces these paintings after Gemelli, Carer, and Lord Kingsborough. They are very curious.

The museum of Mexico possesses a whole series of paintings, showing the education of children, the food which was given to them, the tasks which were set them, and the punishments which were inflicted upon them. Bancroft (vol. II., p. 589) gives these figures after the *Codex Mendoza*.

These pictures have the distinct outlines and brilliant colors at which the Aztecs aimed above every thing, as we have already seen, in speaking of their sculptures; they did not aspire to an exact imitation of nature, still less to a beautiful ideal, which they were incapable of understanding. "We see in the Mexican paintings," says Humboldt, "heads of an enormous size, a body extremely short, and feet which, from the length of the toes, look like the claws of a bird. All this denotes the infancy of the art; but we must not forget that people who express their ideas by paintings, and who are compelled by their state of society to make frequent use of mixed hieroglyphical writing, attach as little importance to correct painting, as the literati of Europe to a fine handwriting in their manuscripts." Without agreeing with Humboldt's comparison, it is certain that we must not seek amongst the Aztecs for models of decorative painting such as those recently discovered in the Palatinate; the ignorance of the artists shows that their work was a spontaneous product of their genius, and that they had not been subjected to any foreign influence on the soil of America. According to

tradition they borrowed their processes from the Toltecs, the initiators of all progress in Mexico and Central America. After their final victory it is said that the rulers of Mexico had the paintings destroyed which recalled the grandeur of those they had conquered. By a just retribution, but unfortunately for science, the Spaniards in their turn destroyed the Aztec annals, and a few incomplete copies, a few fragments that escaped this barbarous destruction, are the only original sources of information from which it is now possible to draw.

It is easy to understand the first idea of the hieroglyphics. First of all engravings on rocks give the animate or inanimate object which struck the eye of the artist. In all ages this is the primitive form of the art. Then arose a desire to represent not only men or objects, but also certain scenes, such as a battle, a migration, or a fire, the memory of which they wished to preserve. Later, by way of abbreviation, the artist was content to express names or things by conventional signs. An arrow, for example, signified an enemy; several arrows, several enemies; the direction of the point, the direction these enemies had taken. Often the names themselves had a signification lending itself to representation by a figure, thus: *Chapultepec*, the hill of the grasshopper; *Tzompanco*, the place of skulls; *Chimalpopoca*, the shield full of smoke; *Acamapitzin*, the hand full of reeds; *Macuilxochitl*, the five flowers; *Quauhtenchan*, the dwelling of the eagle. In other cases names are translated by regular puns. To give one instance, Itzcoatl, ruler of Mexico, was represented by a serpent, *coatl*, pierced by several splinters of obsidian, *itsli*. Hence by a rapid translation was given, not the true form of the objects, but the representation of the name they bore in the spoken language; then by a very simple link, signs were replaced by letters, and an alphabet was complete.

Hieroglyphics, true conventional signs, mark then a period of human evolution. They are met with on the monuments of Chiapas as on those of Yucatan; on the walls of Palenque

or Copan, as on those of Chichen-Itza or Quirigua (figs. 113, 124, 126, 127, 128, 130); they were sculptured or engraved on granite or on porphyry, with quartzite and obsidian implements.¹ Iron, we repeat, was absolutely unknown; nowhere do we find it mentioned, and nowhere do we meet with the characteristic rust which is the undeniable proof of its presence.

Hitherto it has been impossible to discover a key by which to decipher the hieroglyphics. Las Casas tells us that in his time there were still men learned in the reading and the reproduction of these signs,² whose business it was to register events, noting the day, the month, and the year in which they happened; and he adds that these men so thoroughly understood what they had written, and what the ancients had written before them, that our letters would have been useless to them. In earlier times these hieroglyphics were executed by the priests of the god Centeotl, which priests had to be old men, widowers, and vowed to continence and a contemplative life. It was then a hieratic writing, known to the initiated only, which is reproduced in the Maya manuscripts of which we have spoken, especially in the Codex Perezianus and that of Dresden. Bancroft (vol. II., p. 771) enters into minute details in regard to these various manuscripts. He reproduces fragments of two of them; it is easy, by means of comparison, to make sure of their similarity to the hieroglyphics of which we are speaking. Bishop Diego de Landa speaks of a graphic system³; he has even preserved an alphabet of thirty-three signs, one of which is intended to mark the aspirate; but unfortunately the alphabet has only come down to us in a very imperfect form; and in

¹ Gomara: "Conq. Mex.," p. 318. Clavigero: "Stor. Ant. del Messico," vol. II., p. 205.

² "Hist. Apologetica de las Yndias Occidentales."

³ "Relacion de las cosas de Yucatan," published in 1864 by Brasseur de Bourbourg, with a French translation. It is fair to add that the aim of the bishop was to prepare for the natives religious books with signs which were familiar to them. He did not occupy himself with art, history, or archaeology. Some well-founded doubts, we must add, exist as to the value of his alphabet.

spite of estimable earnest works¹ on the subject, it has been impossible to decipher, with its help, either the manuscripts, or the hieroglyphics, which according to all appearance are more ancient than they.

The letters given by Landa, however, sensibly resemble those of the manuscripts²; they may, therefore, be a connecting link between the hieroglyphics and the graphic writing. The words, arranged in the same order as ours, appear most probably to be constructed on the polysynthetic system, and present that character so characteristic of the languages of the New World. They were written on real paper, made either of the root of certain plants, such as the agave, on prepared skins, or even on cotton cloth. Several leaves were enclosed between richly ornamented wooden boards. These are called *analtees*, and this word cannot be better rendered than by *annals*.³

The Troano manuscript is written on a strip of paper fourteen feet long by about nine inches wide. The characters, which are red, brown, sometimes blue, according to the text to which they relate, are written on both sides. The paper opens out as does a fan, and each leaf thus represents thirty-five pages. The chief manuscripts which have come down to us, and which must not be confounded with those already mentioned, are the Codex Mendoza, sent to Charles V., by the viceroy Mendoza, now in the Bodleian Library at Oxford, and of which a copy is in the Escorial;

¹ We will mention L. de Rosny: "Essai de déchiffrement de l'écriture hiératique de l'Amérique Centrale," Paris, 1875. De Charency, "Recherches sur le Codex Troano," Paris, 1876. "Essai de déchiffrement d'une inscription palenquienne"; Actes de la Soc. de Philologie, vol. I., March, 1878. Unfortunately when this last work appeared, we had only very imperfect reproductions of the hieroglyphics of Palenque. Charnay has lately sent to Paris plaster casts of them, and every one can now consult them in the Trocadero Museum. See also Bollaert's paper published in the "Memoirs of the Anthropological Society of London," vol. II., p. 298. We do not speak of the works of the Abbé Brasseur de Bourbourg, which are characterized rather by imagination than by science.

² Ch. Rau, p. 57, "Smith. Cont.," vol. XXII.

³ Peter Martyr, decade iv., book viii. Juan de Villagutierre y Sotomayor, "Hist. de la Conquista de la Province de el Itza," Madrid, 1701.

the Codex Telleriano-Remensis in the National Library of France; the Codex Vaticanus copied at Mexico in 1566, in the Vatican Library at Rome; the Codex Borgia, in the college of the Propaganda at Rome; the Codex Bologna, supposed to be a treatise on astrology; and lastly a codex, the origin of which is unknown, but which we know to have been given to the Emperor Leopold in 1677 by a duke of Saxe Eisenach. Lord Kingsborough also gives representations of fragments of several other manuscripts, and it is to his magnificent work that those who wish to make a special study of the subject should refer.

To sum up, the Mexican manuscripts which have escaped so many causes of destruction include three very distinct kinds of painting: figurative painting, in which the artist reproduces more or less exactly the objects before his eyes; symbolical painting, in which the object is represented by a conventional sign; and, lastly, phonetic painting, in which it is no longer the object, but the name it bears, that the artist endeavors to give. These three styles still existed in Mexico on the arrival of the Spanish, for we know that when Juan de Grijalva appeared on the coast of Vera Cruz, the Cuertlachtlan chiefs hastened to send to Montezuma very exact paintings of the vessels, weapons, and clothes of these strangers, who already so justly excited the alarm of the Mexicans.¹

The luxury of the private life of the wealthy inhabitants of these sumptuous towns was on a par with that of the public buildings. The chairs on which they sat in the Oriental style were of wood, often imitating the form of an animal, such as a tiger or an eagle, for instance. These chairs were covered with the tanned skins of deer, and ornamented with embroideries in gold and silver. Skins of the same kind were used to decorate the walls of the principal rooms, or they were painted in gaudy colors, red and blue

¹ Torquemada: "*Mon. Ind.*" p. 378; Acosta: "*Hist. de las Ynd.*," p. 515; Veytia: "*Hist. ant. de Mejico*," vol. III., p. 377; Herrera: "*Hist. Gen.*," dec. II., book III., ch. IX.

being most generally preferred.¹ They had at home vases of agate or precious stone, ornaments, statuettes of gold or silver cast in one piece, eight-sided dishes, each side of a different metal, fish of which the scales were made of gold and silver mixed, and parrots that moved their head and wings. It has even been alleged that they were acquainted with the art of enamelling, and that they knew how to



FIG. 152.—Earthenware vase found at Ticul.

temper copper so as to render it hard enough to make hatchets and very sharp knives. The Peruvians are also said to have possessed such a secret, but no weapons or ornaments have been discovered in either country to justify this assertion.

Cortes mentioned to Charles V. his surprise at the number of gold, silver, lead, copper, and tin² ornaments publicly exposed for sale. In some places little bits of tin were used as money; elsewhere pieces of copper, very much like the

¹ Ordoñez: "Palenque," quoted by Brasseur de Bourbourg: "Hist. des Nat. Civilisées, vol. II., p. 69.

² Tin (*tachco*) is chiefly found near the town of Tazco, from which it takes its name. "Carta secunda de Relacion," 30th Oct., 1520.

tau (τ) in form; or quills filled with gold-dust served the same purpose. Trading was, however, chiefly carried on by barter, and payments, according to Bollaërt, were made in balls of cotton or cacao-nibs. The copper objects often contained a certain amount of silver; but as silver is found in copper in its natural state, we must not, therefore, conclude that the Mexicans were acquainted with alloys of metals. The tissues used were no less rich; the goddess Ixalzavoh, it is said, had herself taught the people of Yucatan the art of spinning and weaving; and the numerous and varied dye-woods of these districts furnished ample means of coloring cloth.

The pottery was remarkable, alike in style and execution. Herrera speaks of a province of Guatemala, where it was the especial duty of the women to make it, and Palacio adds, that this manufacture was the chief industry of Agua-chipa, one of the towns of the Pipiles, of the Maya race, who inhabited the territory now forming the republic of San Salvador. We give a reproduction of a vase found at Ticul, near Uxmal, (fig. 152), the monkey face forming the centre of the decoration, is remarkably characteristic of designs of Palenque. We also give a little terra-cotta figure (fig. 153), found in Chiapas, near Ococingo; whether it be an idol or a grotesque, it has about it a certain artistic merit.

The Nahuas were inferior in nothing to the Mayas. They not only fashioned vases of the most varied form for domestic use,¹ but also images of the gods they worshipped, statuettes of animals or serpents, censers in which they burnt copal on holy days; bowls, beads for personal ornament, and trumpets or flutes, with which they imitated the cry of different animals.

¹The different museums of Europe, such as the Christy collection in London, the Unde collection at Heidelberg, and others, contain numerous specimens of the art of American potters. Above all, we must mention the National Museum of Mexico; the Smithsonian Institution and the National Museum at Washington. The catalogue of the first of them was published in Vol. III. of the "Philosophical Transactions," and that of the second by Charles Rau: "Smith. Contr.," vol. XXII.

These musical instruments of terra cotta were of very fine workmanship; they were four or five inches long, and pierced with several holes, which gave forth from two to six different notes. In nearly all of them the mouth is modelled so as to represent an animate object, such as a flower, an animal or a man (fig. 154). The human faces, like those of



FIG. 153.—Terra-cotta statuette found at Ococingo.



FIG. 154.—Earthenware flute.

the idols (fig. 155), are always grotesque and hideous, affording another proof that these people had no idea of beauty, or rather of beauty such as we conceive it. When the Mexicans departed from the human form, the decoration of their vases is perhaps too profuse, but not at all inartistic (figs. 156, 157, 158). We mention especially a vase more than twenty-

two inches high by fifteen in diameter, found in an excavation under one of the public squares of Mexico, not only



FIG. 155.—Idol from Zachila.



FIG. 156.—Vase from the National Museum of Mexico.



FIG. 157.—Vase belonging to the National Museum at Washington.

on account of its form and decoration, but because it was filled with human skulls, curiously piled one on top of the other.

Some Mexican pottery is probably of great antiquity, and it may even be of earlier date than the arrival of the Toltecs in Anahuac. Indeed, recently have been discovered, in a cave of the province of Durango, thousands of dried mummies; and with these mummies hatchets, arrow-points of flint, and vases remarkable in form and decoration.¹

The Aztecs were no less skilful in working obsidian than in moulding clay. They made of obsidian, in spite of the



FIG. 158.—Mexican vase in the National Museum at Washington.

difficulties of cutting and polishing it, knives, razors, lance- or arrow-heads, mirrors, and sometimes masks, which they placed on the faces of the dead at the time of the funeral. This last custom was general, for the chiefs at least, for similar masks have been found in several places, not only in obsidian, but also in marble or serpentine.² Lastly, the

¹ "Proc. Anthr. Soc. of Washington," 1879, p. 80.

² Math. de Fossey: "Le Mexique," Paris, 1857, p. 213. It is also a characteristic of the Aleuts and Western Eskimo of the northwest coast of America, and has been treated of at length in the "Report of the Bureau of Ethnology at Washington for 1883."

National Museum of Mexico contains numerous and interesting agate, coral, and shell ornaments. The Christy collection of London is no less rich, and from it we illustrate a chalcedony knife. The handle is a mosaic made of turquoises, malachite, and white or red shells. It is surprising to find a people still in the stone age executing such delicate work with the wretched implements we know of.

To sum up, every thing goes to prove that the ancient races of Central America possessed an advanced culture, exact ideas on certain arts and sciences, and remarkable



FIG. 159.—Knife with chalcedony blade, in the Christy collection.

technical knowledge. As pointed out in 1869 by Morgan, in the *North American Review*, the Spanish succeeded in destroying in a few years a civilization undoubtedly superior in many respects to that which they endeavored to substitute for it. We are not at all surprised at this severe judgment, which we should endorse if we did not think that the suppression of the human sacrifices, of which we have described the gloomy horrors, ought to be taken into account before pronouncing a final judgment on the peoples of the New World and on their cruel and bigoted conquerors.

CHAPTER VIII.

PERU.

THE chain of the Andes traverses the whole of South America, and near the boundary between Bolivia and Chili it divides into two branches, the principal still called the Cordillera of the Andes, and the other and nearer to the Pacific the Cordillera de la Costa parallel with the Pacific, which enclose between them, at a height of above 3,000 feet, the Desaguadero, a vast table-land, the area of which is equal to that of France. At one of the extremities of this table-land is Potosi, the most elevated town of the globe, 13,330 feet above the sea level; and on the north is Cuzco, the ancient capital of the Incas; whilst between them lies Lake Titicaca, the greatest body of fresh water in South America.

The whole country is dreary and desolate; no luxuriant vegetation breaks the gloom of the landscape; cereals cannot ripen, and animals are rare. Between the Cordillera de la Costa and the ocean are arid rocks, sands on which nothing can grow, resembling the great deserts of Africa,¹ with a few valleys, formed by the tributaries of the Amazon, and swallowed up in these vast solitudes, the sole possessors of the wealth of tropical nature.

Nowhere in the world, perhaps, has man displayed greater energy. It was in these desolate regions that arose the most powerful and most highly civilized empire of the two Americas, and at the present day its memory is everywhere preserved in the imposing ruins covering the country, the

¹ "Sahara is a thing of beauty, and Arizona a joy forever, compared with the coast of Peru." Squier, "Peru," p. 25.

fortress defending it, the roads intersecting it, the *acequias* or canals conducting the water needed for fertilizing the fields, the *tambos* or houses of refuge in the mountains for the use of travellers,¹ the potteries, the linen and cotton cloth, and the ornaments of gold and silver concealed in the graves, and which are sought for by the *Tapadas* with insatiable zeal.²

The empire of the Incas, of which we are now to speak, was three thousand miles in length by four hundred in width, between S. Lat. 4° and 34°—*i. e.*, from the river Andasmayo of the north of Quito to the river Maule in Chili. It included within its limits Peru,³ Bolivia, Ecuador, part of Chili, and the Argentine Republic. It was as much as one million square miles in area, and when, under the Inca Huayna-Capac, it had reached the culminating

¹ The Quichua name was *tampu*, and *tambo* is a Spanish corruption.

² Montesinos: "Memorias antiguas historiales del Peru," Ternaux Compans published a French translation in 1840; its facts are mingled with many fables. Garcilasso de la Vega: "Los Comentarios reales que tratan del origen de los Incas, reyes que fueron del Peru," 2 vols., fol., Lisbon, 1609-1616; "Hist. des Incas, rois du Pérou," French translation, Paris, 1744. It is the most complete account which we have of the history of the Incas, but Garcilasso, from his retirement in Spain, wrote forty years after the events of which he was witness, and with an evident partiality for the Incas, from whom he was descended by the mother's side. "Tres relaciones de Antigüedades Peruanas publicadas el Ministerio de Fomento," Madrid, 1879. This volume contains "Relacion por el Licenciado Fernando de Santillon"; "Rel. Anonima"; "Rel. por D. Joan de Santa Cruz Pachacuti." Humboldt: "Vues des Cordillères et Mon. des Peuples indigènes de l'Amérique," Paris, 1810. D'Orbigny: "L'Homme Américain," Paris, 1834-1847 (Extract from "Voy. dans l'Amér. Meridionale," 9 vols., 4°). E. de Rivero et Tschudi: "Antigüedades Peruanas," Vienna, 1851, and "Die Kechua Sprache," Vienna, 1853. W. H. Prescott: "Hist. of the Conquest of Peru," 7th edition, London, 1854. Hutchinson: "Two Years in Peru." E. Desjardins: "Le Pérou avant la Conquête Espagnole," Paris, 1858. W. Bollaert: "Antiquarian, Ethnological, and other Resarches in New Granada, Ecuador, Peru, and Chili," London, 1860. Mateo Paz Soldan: "Geog. del Peru," Paris, 1862. V. F. Lopez: "Les Races Aryennes du Pérou," Paris and Montevideo, 1871. Squier: "Peru, Incidents of Travel and Exploration in the Land of the Incas," 2d edition, London, 1878. C. Wiener: "Pérou et Bolivie," Paris, Hachette, 1880.

³ The name of Peru is a Spanish invention. The inhabitants called it Tavan-tisuyu, literally "*the four parts of the world*."

point of its grandeur, its population may possibly have numbered from ten to eleven million souls.¹

The origin of the Incas is unknown, and there is nothing known of the real history of the country covering more than four hundred years before the Spanish conquest. According to tradition Manco-Capac and the beautiful Mama-Cello, his sister and his wife, made known the first elements of civilization to tribes which had previously been savage and barbarous. In obedience to them these men broke their idols to adore a spirit, Creator and Preserver of the world, of whom the sun and the moon were the visible form. Montesinos gives the history of one hundred and one rulers who, after Manco-Capac, wore the head-dress (*llantu*) denoting their sovereignty, and he dates their origin from the fifth century before the deluge.

In this account a little truth is mixed with much fable. It is certain that before the time of Manco-Capac the inhabitants of the country were by no means plunged in barbarism. The Quichua culture had a past, of which the theocratic and social organization founded by the first Inca was but a development. Numerous buildings are undoubtedly earlier than the Incas, at least than those of whom authentic history has preserved an account. They are distinguished by their more massive character, their bolder and more artistic construction, and by certain general features presenting some resemblances to sundry Asiatic monuments.² As for the narrative of Montesinos it doubtless refers in part to the history of different people or tribes, the union of which later formed the dominion of the Incas. These people certainly had common bonds of union. A curious analogy is presented by the monuments which may be attributed to them, the sepulchral tumuli, fortresses, and temples preserve similarities of style from Arica to San

¹ A census ordered by Philip II. indicated no more than eight million two hundred and eighty thousand, and at the present day the population of these countries does not amount to half this number.

² Angrand : "Lettre sur les Antiquités de Tiaguanaco," Paris, 1866. Allen : "La très Ancienne Amérique," Nancy, 1874.

José; everywhere the ornaments, pottery, and mode of burial are identical; every thing indicates a common origin.

At the time of the Spanish conquest those aboriginal races were represented by the Aymaras, who inhabited the table-land of the Andes, and the Qquichuas, established around Cuzco.¹ D'Orbigny is of opinion that the differences between them were rather apparent than real. There are decided analogies in the grammatical structure of their language; a great number of the words are the same, and the differences we notice are such as are usually met with in dialects emanating from a single source.² Side by side with these undeniable relations, however, there are dissimilarities so marked that they must be attributed to different biological conditions, and we conclude that, if there be a kinship between these races, their common origin must be carried back to a remote period.

To sum up: In the present state of knowledge, it is difficult to determine the connection between the Aymaras and the Qquichuas, and we cannot do better than compare it with that which we have pointed out between the Mayas and the Quichés, or better still between the Toltecs and the Aztecs. Whilst admitting the possibility of this hypothesis, there is yet another, even more plausible, which Humboldt was the first to advance, and which Angrand upholds with weighty reasons. The Qquichuas may have come from the north, probably several centuries after the Aymaras, and we must look for their ancestors among the prolific races of Central America.³

¹ Markham: "The Tribes of the Empire of the Incas," Royal Geog. Soc., 1871. D'Orbigny: "L'Homme Américain," vol. II., p. 306. Forbes: "The Aymara Indians," *Journ. of the Ethn. Soc.*, London, 1870. Ch. Wiener: "Pérou et Bolivie," Paris, 1880.

² Don V. F. Lopez supposed Qquichua to be an Aryan language; but in that case would it have remained agglutinative with words such as *Mananceallaby-cucullahuancupasraocchu* (they have not had the kindness or the charity to think of me). See also Tschudi: "Die Kechua Sprache," Cong. des Américanistes, Luxembourg, 1877, vol. II., p. 75.

³ Angrand, *l. c.*, p. 37 et seq.

Setting aside conjectures more or less justified, the native account generally accepted shows us Manco-Capac reigning from 1021 to 1062, while by another version he only reigned thirty-six years and died in 1054. Fourteen Incas succeeded him, several of whom were remarkable men, under whom the government became consolidated and increased in territory.¹ The last was Atahualpa, whose short reign was marked by a fierce struggle with his brother Huascar, and by the cruel massacres which terminated it.

A more dangerous enemy was about to appear; Pizarro disembarked in the Bay of San Mateo in 1534,² having with him three vessels, 174 men and twenty-seven horses. A little later he received a reinforcement of 130 men. It was before these feeble forces that the empire of the Incas was to succumb. Atahualpa was beaten and made prisoner at Caxamalca. A little later, implicated in a probably imaginary conspiracy, he was condemned to perish by fire. In vain he offered, to save his life, to fill one of the rooms of his palace, as high as a Spaniard on foot could reach with his hand, with ornaments, vases, and gold and silver jewels. This room, according to Xérès the secretary of Pizarro, was twenty-two feet long by seventeen wide. The conquistadores accepted his riches, but the only favor the unfortunate Inca could obtain, and that on condition that he would receive baptism, was that of being strangled instead of being burnt. The notary Sanchez has preserved for us the act, dated the 17th of June, 1533, sanctioning the division of the ransom of the Inca. Pizarro received for his share 2350 marks of silver and 57,220 pieces of gold; his brother Hernandez, 1,267 marks of silver and 31,080 pieces of gold. The church deducted to begin with, as tithe, 90 marks of silver and 2,220 pieces of gold.

It is not our intention to relate here, either the history³

¹ "No ha habido en la tierra monarcas mas despoticos que los Incas, Eran adorados como seras sobrinaturales." Paz-Soldan, "Geog. del Peru."

² A first exploration of the coast of Peru by Pizarro took place in 1524, under the reign of Huayna-Capac. F. Xérès: "Rel. de la Conq. du Pérou"; Ternaux-Compans, translation.

³ "Itineraries of Francisco and Hernandez Pizarro," published for the

of the Incas or that of the Spanish domination. What we want to do is to make known the strange people who, in spite of the obstacles due to an inhospitable region, succeeded in occupying the first place among the nations of South America; and this we shall do by describing the ruins, and products of art and industry, left behind by them, and by studying their manners, laws, and religious ideas. We shall tell what were Pachacamac, Chimu, Tiaguanaco, Titicaca, Cuzco, and other towns, with the important monuments of every kind, of which the ruins bear witness. Unfortunately man is daily busy in effecting their destruction; intoxicated by the innumerable legends on the hidden riches of the Incas, the treasure-seekers or *tapadas* dig zealously everywhere; the walls are crumbling beneath the pick-axe; the sculptures are breaking; the subterranean passages are falling in; all the mementos of a great past are disappearing, and men are overturning in an instant what has been respected for centuries.

Pachacamac¹ is situated on the Pacific, twenty miles from Lima. A few miserable reed huts have replaced the sacred town of the ancient Peruvians, with a few ruins, difficult even to describe, of monuments that at the time of the arrival of the first Inca, were already old. A silence, scarcely broken by the flight of a few condors, reigns in districts where pilgrimages once attracted an immense concourse of the faithful, and a single burial-place (figs. 160, 161) of considerable extent, remains the sole witness of bygone grandeur.

According to Estete, one of the companions of Hernandez Pizarro, who was sent by his brother to reduce Pachacamac to submission, the town was large, and near the temple rose a house surrounded by a series of five walls which was called "The house of the Sun." There were also, he tells us, many other large houses, with terraces similar to those met with in Spain. It must have been a very ancient town,

Hakluyt Society by C. R. Markham, London, 1872. Consult Desjardins' excellent work, "Le Pérou avant la Conquête Espagnole."

¹ From *pacha*, the earth, and *camac*, participle of *camani* to create. Desjardins (note 1, p. 23,) however gives another etymology.

judging from the numerous buildings in ruins. At the time of this writer the whole town was surrounded by a wall, already in ruins in several places, and with large doors opening out of it.

El Castillo, to which Estete's description doubtless refers, rose from a rock 500 feet above the sea-level. The walls of the rock were faced with adobes painted red, forming four terraces,¹ one behind the other. This is an arrangement resembling that noticed in Central America,² and bears



FIG. 160.—Peruvian mummy.



FIG. 161.—Peruvian mummy.

witness to the relation which certainly existed between the inhabitants of the two areas. The platform covers several acres of ground, and on it the ruins of what were once important buildings can still be discerned. The temple faced the south. Estete goes on to tell us that it was a fine house, well painted and decorated, and that in a very dark and offensively-smelling recess, always kept closed, was a wooden idol, which represented for these people the image

¹ Such is Squier's account. Wilkes ("U. S. Exploring Expedition") and Markham ("Cuzco and Lima") speak of only three terraces.

² The pyramidal mound of Cholula may especially be compared with it. Hutchinson: "Two Years in Peru," vol. I., p. 159-303. Markham: "Cuzco and Lima."

of the Creator. At its feet were numerous gold and silver ornaments, the offerings of the worshippers of the god. None but the priest were allowed to enter this recess.

After a visit to the sanctuary, which quite stupefied the natives with astonishment, Hernandez destroyed the image of Pachacamac, after whom the town was called. He was still more eager to take possession of the treasure, and contemporary chroniclers relate that the Spanish obtained twenty-seven *cargas*¹ of gold and 16,000 ounces of silver; unfortunately, they add, they were not able to discover the principal treasure which may have amounted to 400 *cargas* of gold.



FIG. 162.—Niche in a wall at Pachacamac.

A mile and a half from El Castillo, near a little lake, the ruins of a nuns' convent (*Mamacuna*) still exist. The details of the structure remind us of those of the buildings of the Incas; and the erection of this convent is therefore attributed to them; by skilful policy they were careful to show veneration for this spot, so sacred to their subjects.

Garcillasso relates that the whole of the coast, from Truxillo, a modern town founded in 1535 by Pizarro, to Tumbes, for an extent of more than six hundred and twenty-five miles, belonged to a people known under the name of *Chimus*.

¹ The *carga* equals about 62 lbs.

Montesinos alone speaks of the origin of this people. His idea is that the strangers came from the ocean, and that, more warlike and better armed than the natives, they rapidly reduced to submission all who lived between the sea and the mountains. We have already remarked that Montesinos' accounts must be received with caution; but in this case they are corroborated by the singular resemblance of the "huacas" we are about to describe, with the *teocallis* of Mexico and Central America. Such a resemblance cannot be accidental. Historians add¹ that, at the time of Pachacutec, the ninth Inca, the country was governed by Chimu-Canchu, who was greatly dreaded by his neighbors. Yupanqui, son of Pachacutec, wished to compel Canchu to acknowledge himself the vassal of Pachacutec, and to give up the worship of animals,² and to adore the sun-god. A bloody war succeeded the refusal of Canchu; but the Chimus were compelled to give way before superior numbers and submit to the conquerors. From this moment until the arrival of the Spanish, their history may be summed up as a perpetual series of revolts which show their horror of a foreign yoke.

Their capital, which also bore the name of Chimu, covered a considerable area. The ruins extended from the Monte Campana on the north to the Rio Moche on the south, over an area of twelve and one half to fifteen miles long by from five to five and a half miles wide.

In every direction, for an extent of several leagues, long lines of massive walls, huacas,³ palaces, aqueducts, reservoirs of water, and granaries can be made out. Every thing proves the power and wealth of a people, the very name of whom has remained uncertain.

Of the monuments, the huacas are the most important.

¹ Garcilasso, *I. c.*, vol. I. p. 234.

² The animals which were the objects of their adoration were probably symbolical; fishes, the tortoise, and the crab represented water; the serpent and the lizard, the earth. The lance, also met with in the temple, is supposed to have been the symbol of thunder and lightning.

³ The word *huaca* usually denotes a sepulchre, but its meaning is extended to embrace any consecrated or venerated spot.

This is a name given to truncated pyramids nearly always built of stones, cemented with a very plastic clay and forming a durable conglomerate. The Obispo huaca, one of the most remarkable, is no less than one hundred and fifty feet high, with a base of five hundred and eighty feet square; it covers, says Squier,¹ an area of eight acres, and it is estimated that nearly fifty million cubic feet of materials were used in its construction. Excavations have been made on the faith of legends telling of subterranean chambers filled with gold and silver, and Squier, one of the last travellers to visit it, tells us that it looks from a distance like the huge crater of a volcano.

Another huaca rises not far from Obispo, in the centre of an enclosure of adobe two hundred and fifty-two feet by two hundred and twenty-two. Its walls measure fourteen feet in height by six feet in breadth at their base. We mention it, though its height is not considerable, on account of the bones which it encloses, and which are the best proof we have of the purpose of at least a certain number of these huacas.

The abodes of the dead, in every variety of form, appear to be the last mementos of this people, and are met with all about the neighborhood of Chimú. A vast sandy plain stretches away to the sea, overlooked by a hill on which rises a huaca, like an outpost; this plain is covered with graves, where lay skeletons very irregularly buried in the most varied positions, victims doubtless of the battles in which the Chimú defended their independence. This is a plausible idea, for a great many skulls are fractured as if by the blow of a club, and others have holes in them, such as might have been made by the bronze arrow-points picked up in the same place.

Skirting along this plain we come to the little village of Moche. This village possesses a huaca, which passes as the most considerable of any in the country.² *El templo del Sol*

¹ "Peru," p. 120.

² Squier: "Peru," p. 130.

(all the important ruins of Peru are called temples of the sun) is a rectangular building eight hundred feet long by four hundred and seventy broad. It covers an area of more than seven acres, and its greatest height is two hundred feet. The mode of construction is very peculiar: Huge blocks of adobes, at a short distance from one another, form pillars, inclined at an angle of seventy-seven degrees. These pillars were covered with a very thick stucco which secured the stability of the platform, which was crowned by several buildings, of which no traces can be made out. At the southern extremity rises a truncated pyramid, formed of receding terraces one above the other. Seven of these terraces are still standing and an attentive examination justifies us in assuming the original number to have been nine; the summit was reached by a slope so gentle as to be imperceptible. The rooms, recesses, and subterranean passages have been excavated, but without more success than at the Obispo huaca. All they revealed was that these two huacas were not burial-places, as was at first supposed.

The palace¹ included an irregular series of buildings in adobes, covering an area of several acres, and rising from a mound made up of successive terraces. The external walls were ornamented in such a manner as to break their monotony. We give a drawing of one of the most usual modes of treatment, which will give an idea of the general effect (fig. 163). The interior included a series of halls, rooms, corridors and vaulted crypts. One of these rooms is more than fifty-two feet in width; but its length remains uncertain, on account of the rubbish with which it is choked up. It certainly, however, exceeded one hundred feet. The walls are richly ornamented with stuccos in relief, fine arabesques, and Greek frets, reminding us of those of Mitla. At a height of about twelve feet we notice several niches five feet wide. These niches are one of the most striking characteristics of Peruvian architecture, but it is impossible to as-

¹ We retain the name *palace* given by Squier. This building, or rather this collection of buildings, was evidently used as a palace.

certain their purpose. In other rooms the walls are covered with a coating of color, generally dark red. There is a corridor, the door opening into which consists of a double row of pilasters, whilst the walls are covered with figures in relief, which have been supposed to represent monkeys, carrying on their heads a sort of half moon. This ornament must have had some special signification, for it is often repeated on the pottery and metal vases of the Chimus.



FIG. 163.—Ruined walls at Chimu.

Colonel la Rosa, one of the most eager and fortunate of the tapadas, discovered in a vault of the shape of a well, which he had to get into through a narrow opening, a considerable collection of gold and silver vases (fig. 164), some of which were covered with ornaments in relief. The body of these vases was very thin, those in silver had a large admixture of copper, and were in such a state of oxidation that they broke in the fingers of the excavators. Unfortunately,

nearly all were melted down immediately after their discovery. The vase of which we give a drawing is in the Squier collection, and is one of the few which have been preserved. The disorder in which these costly articles, evidently hidden in haste, were found, leads us to suppose that an effort was made to place them in safety, either during the struggles between the Chimus and the Incas, or on the arrival of the conquistadores.

The necropolis of the rulers of Chimu was a short distance from their palaces.² An excavation has laid bare walls of immense thickness, the length of which has nowhere been verified. A staircase led to a series of vaulted chambers, all with one or more niches. In these niches reclined dried-up mummies, the skulls of some of which were painted red, while others, if we accept Colonel La Rosa's account, were gilded. The bodies were clothed in rich stuffs, and wore feather crowns and gold and silver ornaments. These ornaments have disappeared, and Squier was only able to procure a few fragments of a stuff made of cotton and wool, with figures of lizards and birds of the most varied colors woven in with the woof.



FIG. 164.—Silver cup found at Chimu.

We will not pause to give a detailed account of all the ruins of Chimu; *el Presidio*, the prison, alone deserves to be excepted. This is an enclosure 320 feet by 240, surrounded by a wall twenty-five feet high by five and a half at the base. In the centre is a mound, the foundations of which, of exceptional solidity, rest upon huge blocks of stone. Excavations have brought to light, a little below the level of the soil, forty-five cells arranged in five rows, and without any communication between them. Hence the name of the

² Squier: "Peru," p. 144.

building, and if it be really a prison the inhabitants of Chimu were the first to conceive the idea of what we may call the cellular system. Wiener remarks that the present town, built in 1533, has been thrown down three times by earthquakes. The solidity of the buildings of the ancient inhabitants enabled them to resist these terrible shocks.

At Chimu we can make out private houses. This is rare enough, for in most ruined towns the monuments alone have resisted the inroads of time, and the far more formidable devastations of man. These buildings, some round, some square, were arranged with great regularity in streets or squares. The rooms, of course, vary in number and size, the largest reached twenty-five feet in length by twelve in height. A very curious piece of pottery represents a house with a pointed roof, a single door, and a hole in the gable, probably to ensure ventilation. These must have been the homes of the people, and their number bears witness to a considerable population.¹

Tiaguanaco² rises in the centre of a basin formed by two lakes of very unequal size, that of Titicaca and that of Aulagas, on a table-land surrounded by lofty mountains, overlooked by Illampu, which is 18,000 feet high, and is the loftiest mountain of South America. This table-land is 12,000 feet above the level of the sea, almost at the line of perpetual snow. At this height vegetation is impossible, no cereal can ripen, breathing is difficult, there is nothing produced by which life might be sustained.

In this arid and desolate region, so difficult of access, men had, however, erected an important town and remarkable buildings.³ Garcilasso relates that when Mayta-Capac, the fourth Inca, for the first time penetrated into the country, the sight of these monuments awoke in the Peruvians a profound astonishment, and they were at a loss to make out

¹ Squier, *loc. cit.*, p. 181.

² Such is the name given to the town by the Incas. Its ancient name remains unknown. Angrand: "Lettre sur les Ant. de Tiaguanaco."

³ Desjardins: "Le Pérou avant la domination Espagnole." Rivery and Tschudi: "Ant. Peruanas."

what processes had been employed in their construction. Tiaguanaco was the seat of a civilization at once the most ancient and the most brilliant in South America. This continued contrast between nature and the works of man is one of the most interesting points of the study we are pursuing.

On his arrival in the midst of the ruins, the explorer is struck by the number of monoliths (fig. 165) placed erect at regular intervals, reminding us of those of Stonehenge¹ in the cyclopean size of the stones employed,² and in the profusion of sculptures, ornaments, bas-reliefs, and statues of colossal size, of which eight have thus far been discovered.



FIG 165.—Monoliths at Tiaguanaco.

The ears of the representations of human heads are not distorted, which is yet another proof that they are of earlier date than the Incas, for we know that it was the Inca Roca who introduced the custom of wearing heavy earrings; hence the name of *Orejones*, given by the Spanish to the natives.

The stones employed are red freestone, a slate-colored

¹ Their height is very unequal; the highest measures fourteen feet. The monoliths of Stonehenge vary from sixteen to twenty-one feet.

² Acosta, one of the first Spaniards who entered Tiaguanaco, speaks of stones thirty-eight feet long, eighteen broad, and six thick.

trachyte, and a very hard and very dark basalt.¹ All these stones are admirably polished, and they are so perfectly cut that we may compare their workmanship with that of the granites of the Egyptian pylônes. It is not easy to understand how the workmen could have executed a task so difficult,² when iron was unknown to them, and they had to use implements either of silex, or a rather soft alloy of bronze (*champi*). The stones are laid one upon the other with such precision that the joints are hardly visible, and secured with bronze cramps. The ruins of the monuments have served to build all the churches of the surrounding valleys, and the sculptures of Tiaguanaco are found at a distance of more than twenty leagues, even in the walls of the cathedral of La Paz, the present capital of Bolivia.

Wood was not used in these buildings; at this height trees could not grow, and a little stunted brushwood, or the dried dung of llamas, was the only fuel to be had.

We must now rapidly describe the ruins of Tiaguanaco; and we will keep as data for reference, the names which have been given to the different buildings; but, as Desjardins justly remarks, the popular designations are any thing but suitable to the buildings to which they have been applied.

The *fortress*³ is a mound of rectangular form, which rises to a height of one hundred and fifty feet in successive terraces, one behind the other and upheld by massive walls. This is again the same arrangement that we meet with in Mexico and Yucatan. The platform was covered with buildings, of which the foundations are now scarcely visible. No-

¹ There are large cliffs of red freestone five leagues from the ruins, and beds of trachyte and basalt at Yunguyo. The transport through the mountains must have added to the immense difficulties which the builders had to contend with.

² "In no part of the world have I seen stones cut with such mathematical precision and admirable skill as in Peru; and in no part of Peru are there any to surpass those which are scattered over the plains of Tiahuanuco." Squier, "Peru," p. 279.

³ Garcilasso tells us that the town of Tiaguanaco was remarkable for its large and extraordinary buildings. He speaks of the finest building of the country as a mountain of prodigious height made by the hand of man.

where have the tapadas shown a wilder zeal, excited doubtless by the tradition, which no Indian would think of doubting, that a subterranean communication exists between this fortress and the town of Cuzco, more than one hundred and sixty leagues off.

It is not likely that this pyramid, in spite of the name the natives have given to it, ever served a defensive purpose. The fortresses of Peru have always been built upon places indicated by the situation itself. Many archæologists look upon it as a temple and think it was the scene of the human sacrifices which are said to have been offered up before the domination of the Incas. This is a mere guess, which, in our present state of ignorance, we are able neither to accept nor to reject.

North of the fortress rises the *temple*, the most ancient monument of the town. It forms a parallelogram of four hundred and forty-five feet by three hundred and eighty-eight, and was surrounded by a vast enclosure built of blocks of trachyte, which measure from eight to ten feet long, by from two to four wide, and are from twenty to thirty inches thick. They are of irregular form and less carefully prepared than the stones employed in the other buildings of Tiaguanaco.

The *Hall of Justice* is now nothing but a heap of stones; long and patient study would be required to make out the exactitude of the account written by Cieca de Leon three centuries ago, or even of the plan made by D'Orbigny, in 1833. According to all appearances the building was a parallelogram measuring four hundred and twenty feet by three hundred and seventy. Walls surrounded a platform of earth, leaving in the centre a trench which reached down to the level of the soil. We are ignorant of the purpose of this trench, the walls of which were formed by large stones, said by Cieca de Leon, to be thirty feet long by fifteen wide, and six high, while Squier assigns them smaller dimensions. A door-way still standing gives access to it, with jambs made of a single stone, and a frieze ornamented with human faces in relief.

East of the Hall of Justice we see a mound eight or ten feet high, forming a perfect square of one hundred and seventy-five feet each way. In the centre rose a building fifty feet square, to which Squier has given the name of the *Sanctuary*. It was reached by flights of very narrow steps, and it is easy to make out a kind of *Naos*, which was probably a goal of pilgrims. Tiagaunaco had, in fact, a great renown for sanctity, inferior in nothing to that of Pachacamac, and



FIG. 166.—Doorway at Tiagaunaco.

at certain holidays men flocked to it from all parts of Peru.

Several monolithic door-ways, similar to those we have described, tower above the ruins surrounding them. One of them is probably the most curious monument of the town. Imagine a block of trachyte thirteen feet five inches long by seven feet two inches high,¹ surmounted by a frieze that

¹ This door is four feet six inches high by two feet nine inches wide. Desjardins, *loc. cit.*, p. 159, gives an excellent description of this monument.

has been damaged by lightning; and then four series of cartouches bearing human figures engraved in intaglio, some unfinished, and in the centre a very original and complicated mass of ornamentation (fig. 167). This central or-



FIG. 167.—Central portion of the great monolith of Tiaguanaco.

nament represents a human face, surrounded by bas-reliefs which are said to be of jaguars and condors.¹ The figures

¹ Angrand, who has visited Tiaguanaco, calls attention to its resemblance, even in the smallest details, to the monuments of Palenque, Ocoingo, and Xochicalco.

are probably symbolical; but the religion of the ancient inhabitants of the town is unknown to us, so that we cannot interpret them. In the western face are five niches, two of which are sunk in the soil, so that the height of the monolith has still to be determined.

History and tradition are alike mute on the relations which may connect the builders of Tiaguanaco with the Qquichuas. We are no less ignorant of those which existed between the former and the Aymaras. It is probable, although we cannot positively assert it, that both sprang from Nahua races, and that they came from the north, perhaps even from the prolific table-land of Anahuac. One thing we think certain: such monuments cannot be the remains of a civilization of local growth, nor can a race, unaided, have developed from its own genius such architectural knowledge. We share the conclusion of Angrand, that the civilization of which the remaining ruins bear the impress, could not have taken its rise on these frozen table-lands. Man must have arrived upon them sufficiently armed for the struggle, by previous experience of social life.

Lake Titicaca, of irregular oval form, is one hundred miles long by from fifty to seventy wide; soundings have recently given a depth of 1,710 feet, while the altitude of the lake is about 12,000 feet above the sea.¹ Several islands dot its surface, the most important of which is that of Titicaca, with rugged rocks and irregular shoreline. It is six miles long by three or four wide. Its name comes from *titi*, a tiger, and *caca*, rock; according to tradition, before the arrival of man the island was inhabited by a tiger, that carried on its head a magnificent ruby, the light from which illuminated the whole lake.

This was the sacred island of the ancient Peruvians; and, according to a legend still dear to the inhabitants, it was here that the sun re-appeared resplendent after a total eclipse which had lasted for several days; here, too,

¹ Wiener, *loc. cit.*, p. 390.

were born Manco-Capac and Oello, the children of the sun, and it was from here that they set forth to direct the great destinies of their people.

The island is covered with monuments, the pious offerings of the Incas to the manes of their glorious ancestors. We mention the palace of the Sun, a convent of priests connected with the worship of that god, and the palace of the Incas. On disembarking from the reed-boat (*balsa*), on which every traveller has to trust himself, one sees successively the ruins of three porticos, through which the pilgrims had to pass; the *Puma punco*, or the gate of the puma, where they had to confess their sins; the *Kenti punco*, ornamented with sculptures representing a bird called *Kenti*, where other ceremonies had to be gone through with; and, lastly, the *Pillco punco*, or the door of hope. After having passed through it, the faithful worshipper was allowed to approach the sacred rock, where the sun had risen, lighting up the horizon with its fires.¹ This rock was entirely covered with magnificent tapestries, ornamented with sheets of gold and silver; and in all the hollows were deposited the most costly offerings. None except the priests might approach this venerated spot; pilgrims contemplated it from afar, remaining in a large enclosure, in which can still be seen the foundations of two sanctuaries dedicated to two inferior gods, symbolized by thunder and lightning.

The temple formed a parallelogram of 165 feet by 30, and rose from a rock situated at the extremity of the island. There has been much discussion as to its site; we accept the opinion of Squier (*l. c.*, p. 369), which appears to us the best founded.

It was reached by steps cut in the rock. The walls were of stones, imbedded in a very hard clay and faced with a coating of stucco. Inside we notice a whole series of the niches so characteristic of Peruvian monuments. The principal façade was pierced with five doors, and with two

¹ We take this account from Padre Ramos, who wrote a short time after the conquest.

windows placed at equal distances between each two doors. On the opposite side, a single door opened upon a series of terraces, one behind the other; and by crossing them and going down some skilfully arranged steps, two smaller temples in the same style were reached. They were erected, as were most of the buildings of the island, by Tupac-Yupanqui, the eleventh Inca. They are neither so well built, nor so loaded with ornament, as are those of Tiaguanaco. In them we see art in its decadence, an almost certain indication of a declining culture. If we believe the Conquistadores, the wealth of the temples was immense; but the priests hastened on the arrival of the Spanish, to throw into the lake all their gold and silver vases, to prevent their becoming the prey of the conqueror.

El palacio del Inca occupies a magnificent position, commanding a view of the lake and the snow-capped mountains overlooking it. It forms a rectangle of somewhat moderate dimensions, only fifty-one feet by forty-four, and two stories not communicating with each other can be made out, each including a series of twelve rooms, arranged according to totally different plans.¹ The internal and external walls, like those of the temple, were coated with fairly hard stucco, painted yellow; the jambs of the doors, and the niches, which were the only ornamentation, stood out in red; the roof, of pyramidal form, was made of stones overhanging one another. The great scarcity of wood doubtless led to this mode of building, which must have presented great difficulties.

Lastly, we mention the *tambos*, where the pilgrims lodged; the *pila*, or fountain of the Incas, where the water still flows from unknown springs through subterranean conduits; the *Chingana*, or labyrinth, with its vaulted caves, narrow openings, numerous corridors and tiny rooms. We retain the name of Chingana for these ruins, to which the Spanish had at first given that of *dispensa*, supposing that the treasures of the temple and the objects used in worship were there

¹ Squier, "Peru," pp. 344, 345, gives the plan of each of these stories.

deposited. Squier looks upon them as the *aclahuasi*, which was the name given to the residence of the virgins of the sun: all these suppositions are possible; we leave them to the consideration of the reader.

The island of Coati was about six miles from that of Titicaca. It was two and a half miles long by three fourths of a mile wide, and played a part in the religious system of the Peruvians, almost as important as the island of Titicaca, or as that dedicated to the sun. Coati was consecrated to the moon. In it we meet again with the gates of purification, where took place the same religious ceremonies as at Titicaca, and the *tambos* set aside for the pilgrims; but the most remarkable ruins are those of the palace of the *mamacunas*, or virgins dedicated to the sun. This *aclahuasi* occupied three sides of a vast court; the walls, like those of the other buildings of the Incas, were of rough stones, imbedded in clay and covered with very hard cement. On the ground-floor thirty-five rooms can still be counted; one of these, which was approached by a vaulted corridor, and was the only one in which the walls were made of dressed stones, was probably a sacred spot. The doors were surrounded by niches, which were the only ornamentation; for nowhere do we find sculptures and arabesques such as are so numerous at Tiaguanaco and Chimu. One story, which was reached by several flights of steps, rose above the ground-floor; and the roof, cut by several pediments, presents a certain resemblance to the Elizabethan style so dear to the English. All the rooms communicated with each other; so that here we have the same arrangement as in the pueblos of New Mexico. On the first story two large halls opened on the principal façade; each had the inevitable niche; in the first was placed a golden statue of the sun, and in the second a silver one of the moon. Lastly, the lake was reached by a series of terraces and steps, a good deal like those connected with the palace of the Inca on the island of Titicaca. The two buildings date from the same period; for though the palace of the Virgins was erected during the reign of Huayna-

Capac, his father, Tupac-Yupanqui, laid the foundations. On the west of the palace we can still observe ruins of a semicircular court, in which lived the sacred llamas and vicuñas. It was the duty of the Mamacunas to weave the wool for their own garments and for those of the Incas and their children.

There were other islands on the lake, but we will content ourselves with mentioning that of Soto, to which the Incas retired in times of anxiety, to seek by fasting and prayer the protection of their glorious ancestors.

Legends relate that, when Manco-Capac and Oello left the island of Titicaca, the sun gave to them a golden branch, and instructed them to walk on until the branch should sink into the earth. It was at Cuzco that the marvel took place, and the Incas, full of gratitude to their father, made it the capital of their dominions. The town rapidly rose to great importance, and without accepting the exaggerated accounts of certain Spanish writers, who bring up the number of the inhabitants to two hundred thousand,¹ it is evident that a numerous and obedient population was indispensable for the construction of the buildings, whose imposing ruins still astonish the traveller. It is difficult to imagine how men can have lived at an altitude of 11,380 feet, on a sterile soil, when there were no domestic animals, and maize, the only cereal with which they were acquainted, could only ripen in a few distant valleys.

The town rises from steep slopes; everywhere rocks had to be levelled, terraces erected, and earth upheld by walls, which remind us of the cyclopean structures of Greece or Syria. At Tiaguanaco we found the walls kept in position by bronze cramps; in the island of Titicaca these walls are sometimes of adobes dried in the sun, sometimes of stones cemented with clay; at Cuzco they are of extremely hard rocks, such as diorite, porphyry, and great blocks of

¹ The number of inhabitants of the whole province of which Cuzco is the capital does not now exceed three hundred thousand souls. Such is the sterility of the soil and the struggle for existence, that this number is not at all likely to increase.

brown trachyte, carried by main force, without the help of paths, from the quarries of Anduhaylillas, twenty-two miles off. How the stones were transported to Cuzco is not easy to say; but as the Incas had no beasts of draught it must have been done through the direct application of human force.¹ These blocks were carefully squared and then joined together by means of a mortise about one foot deep by one and a half feet in diameter, into which fitted a tenon of nearly the same size, hewn out of the upper block. The walls were kept in place by their own weight alone, for Squier, (*l. c.*, p. 435) after a careful examination, declares that no cement was used; he adds that all modern masonry, whether executed in Europe or in America, is inferior, when compared with that of the ancient capital of the Incas. In certain characteristics this architecture recalls that of the Egyptians; but this resemblance, curious as it may appear, does not allow any conclusion to be drawn from it; for the primitive ideas of men are of spontaneous origin and develop progressively, according to a universal law which can be traced everywhere.

The valley is overlooked by the *Sacsahuaman*² built on a perpendicular rock which juts out like a spear between two streams, the Huatenay and the Rodadero. From the side next the town ascent was impossible and a path was cut out on the opposite side, along the Rodadero, forming the sole mode of access to this fortress, which, with its triple enclosure of huge irregular blocks,³ its terraces, and its parapets, its projecting and re-entering angles resembling those of modern bastions, was absolutely impregnable

¹ Squier: "Peru," p. 419.

² Comte de Sartiges: *Rev. des Deux Mondes*, 1851. Squier: "Peru," p. 468. Historians differ as to the erection of the Sacsahuaman. Some attribute it to Yupanqui, others to Huayna-Capac, the father of Atahualpa and Huascar. It is probable that it took many years to build it and that several generations of workmen were employed.

³ The total length of the walls is one thousand eight hundred feet; the present height of the first enclosure is twenty-seven feet, that of the second seventeen, and that of the third, fourteen.

before the invention of artillery. Garcilasso¹ places this work on an equality with all that was most celebrated in antiquity, for its execution appeared to him impossible, even with all the instruments and machines known in Europe. Many persons, therefore, he tells us, believed it to have been made by enchantment, on account of the familiarity of the Indians with demons, and the Spanish author owns that he was not indisposed to come to the same conclusion. Though different in kind Squier's enthusiasm was no less great; he does not hesitate to compare the Sacsahuaman with the pyramids, Stonehenge, and the Coliseum. Like those glorious monuments, he adds, it ought to defy time and remain an eternal witness to the power of man.

Three openings in the form of an elongated trapezium give access to the outer enclosure, the *Tiupuncu*, or gate of sand, the *Acahuanapuncu*, and the *Viracochapuncu*,² after the name of the guardian god of the town. Huge blocks of stone were made ready for closing these openings at the first appearance of danger. In the centre of the citadel still remain several minor strongholds, and among them a round tower, the *Muyuc-Marca*, in which were placed the treasures of the Incas, and from which, by one of those freaks of fortune of which history presents so many curious examples, their last descendant was to fling himself down, after the final failure of an insurrection which cost Juan Pizarro his life and brought the Spaniards to the brink of destruction.³

If the fortifications of the citadel bear witness to the skill of the architects, the diverting of water of the Rodadero, by

¹ "Hist. des Incas, Rois du Pérou," French translation, vol. I., p. 268.

² The word *Viracocha* is still a title of honor amongst modern Peruvians. *Viracocha-tatai*, our father Viracocha, is the salutation with which Europeans are always greeted.

³ Manco-Capac II. was recognized by Pizarro as Inca after the execution of Atahualpa. Another legend, dear to the Indians, gives a different account of his death. According to it, Manco-Capac, after the final submission of Cuzco, retired to the Andes, where he continued to struggle against the Spanish, and where he was assassinated by those who had been unable to conquer him. See Prescott: "Conquest of Peru," bk. III., ch. X.

means of acequias or canals of remarkable execution, testifies still more to that of the engineers. We give a drawing of one of those aqueducts (fig. 168), which, like that of the portico of Kabal (fig. 134), recalls the magnificent works of the Romans, which are certainly one of the glories of our ancient civilization.

A hill near the Sacsahuaman is covered with granite blocks, richly sculptured and converted into seats; galleries ornamented with steps, terraces, and niches. The Incas omitted nothing which could add to the splendor of their capital.

The temple of the sun, the wealth of which is still proverbial, was situated on an eminence eighty feet above the Huatenay. The river was reached by a series of terraces. There stretched the celebrated gardens, where, according to the account of Spanish chroniclers, the animals, insects, and the very trees were of gold and silver. The whole of the quarter where the temple was, bore the characteristic name of *Coricancha*, the town of gold.

The temple, now converted into a Dominican convent, occupies one side of a vast court, which preserves the name of *Intipampa*, the field of the sun. The inner and outer walls it is alleged were covered with sheets of gold. This last fact may be true, for Squier relates having seen, in various houses in Cuzco, sheets of gold preserved as relics which came from the temple of the Sun. These plaques, he tells us, were scarcely as thick as a sheet of paper.

Above the altar, which faced east, was a colossal representation of the sun, also in gold, which, after the conquest, became the booty of a certain Mancio Serra de Leguicano, a reckless gambler, who lost it on a single throw of the dice.

All around were laid the dried bodies of the Incas, who seemed to be rendering a last homage to their father.

The court was surrounded with sanctuaries dedicated to inferior divinities, such as the moon, the stars, thunder, lightning, and the rainbow, visible and active manifestations of that Being, superior to all, who was the essence and

supreme cause of every thing. In the centre a fountain hewn out of a stone of considerable size, still gives the monks the water they need. This stone, like those used in making the walls of the temple, was also covered with sheets of gold, and Garcilasso relates that he himself saw the water flow into it through pipes also of gold.

The *Aclahuasi* was only separated from the temple by a large building which served as a lodging for the priests.



FIG. 168.—Aqueduct on the Rodadero.

The walls are still standing, for a length of 750 feet, their height varying from 20 to 25. They bear witness to the splendor of the building, to which the daughters of the Incas were sent at a most tender age, and where they were submitted to a rigorous discipline.

Nor could the Incas neglect their private dwellings, in the town in which they lived. Each Inca erected a palace at his ascension, and at his death this palace became the residence of his son. That of Huayna-Capac, the most illustrious of

his race, was no less than 800 feet long; all its other dimensions were on a similar scale, and the Jesuits have been able to build a church, the viceroys a prison and a barrack, in these structures of impregnable solidity. The palace of Atahualpa was of adobes; and the room is still shown in which he was imprisoned, and which he had to fill with gold for his ransom. Opposite to the palace of the Inca Roca were the schools, *Yachahuasi*, which he had founded, and which he took pleasure in superintending; there the *Amautes*, literally the *wise men*, taught the great deeds of the Incas, and preserved the legends relating to them. Interlaced serpents were sculptured upon the door of the palace of Huayna-Capac, and they are also met with on the walls of Yachahuasi, and of several of the other buildings of Cuzco. These sculptures, which are exceptional among the Inca buildings, have evidently a mythological signification which evades us. In other places hieroglyphics are supposed to exist, which have been compared to those of Mexico or Brazil; but all relating to them is the boldest guesswork.

The Incas appear to have taken extreme precaution against dangers unknown to us. Were these dangers the revolts of their own subjects, or were they the incursions of the ferocious Chinchas, who lived in the impenetrable forests watered by the Amazon and its tributaries? We cannot tell; but it is certain that important fortresses rise from many points in Peru; besides the Sacsahuaman, of which we have just spoken, we may mention Ollantay-Tambo, Pisac, Piquillacta, and Choccequirao.

The Ucayali,¹ one of the branches of the Amazon, flows across the fertile valley of Yucay, between steep rocks, overlooked by the distant lofty snow-laden summits of the Andes. These rocks bear witness to the work and the energy of man; for on every side, even on points apparently inaccessible, and at heights that the condors alone would appear to have been able to reach, we see niches, caves artificially

¹ This river successively bears the names of Vilcamayo, Urubamba, and Yucay.

enlarged, mausoleums supported on pillars crowned by a lintel, and sculptures. Among these sculptures is a puma sucking her cub.

Ollantay-Tambo, fifteen leagues north of Cuzco, was intended to defend the valley of Yucay, and was crowned by lofty towers, now almost entirely ruined.¹ Inside are heaps of huge blocks of red porphyry, which enable us to form an idea of the importance of the fortress. Some of these blocks bear finely-executed ornaments, resembling those of Tia-



FIG. 169.—Wall with niches, forming part of the fortification of Ollantay-Tambo.

guanaco. Walls twenty-five feet high, with battlements like those of the strong castles rising from the banks of the Rhine, cover the sides of the mountain, and stretch away in zigzags to precipices, which form an insuperable barrier.

On one of the perpendicular rocks, more than nine hundred feet high, are seen the ruins of a little building, with a door opening on to the brink of the precipice. The Spanish

¹ "Cieça de Leon," chap. XCIV. Garcilasso : "Comm. Reales," book V., chap. XXVII. Markham : "Cuzco and Lima." Squier : "Peru," p. 482.

gave to it the name of *la horca del hombre*, and, according to legend, criminals were taken to it and flung into the abyss. A little farther off is the *horca de mujer*, where faithless wives had to undergo the same punishment.

We will not leave the valley of Yucay without speaking of a round tower situated on an isolated rock and made of rough stones, faced with a coating of stucco. Inside are niches, and outside is a sculpture, in which an unskilful artist has endeavored to represent a serpent. Above the door, and simulating windows, we meet again with the Egyptian *tau* that we have already seen at Palenque. These ornaments, and the carefulness with which the building is made, have led to the belief that this tower was not a post of observation or defence, but more likely a temple. The peculiar veneration of the ancient Peruvians for isolated rocks justifies this idea. The Indians of to-day have inherited the superstition of their predecessors; and none of them would dare to pass the tower of Calca without bowing profoundly to it, throwing down a stone, and muttering an unintelligible invocation.

The valley of Pauca-Tambo is parallel with that of Yucay, from which it is separated by the chain of the Andes. It was protected by the vast fortified enclosure of Pisac. All the declivities which could aid in ascent are crowned with towers; all the inequalities of the rock are filled in and faced with slabs, covered with very hard and highly polished stucco, impossible to climb over; every strategic point is defended by works, unsurpassed by any thing in modern science. These fortifications stretch for considerable distances, and form, if we may so express it, a vast intrenched camp, in which whole tribes could live protected from attack, and devote themselves in peace to their agricultural occupations.

We must not omit to mention some very curious monuments, to which the name of *intihuatana*¹ has been given.

¹ *Inti* signifies sun; *huatana*, the point where a thing is fixed; so that *Intihuatana* signifies, literally, the point where the sun is fixed.

These are isolated rocks, the summit of which has been completely levelled, and which are surmounted by a little column in the form of a truncated cone. These intihuatana are met with in all the provinces of Peru. Squier mentions several in the valley of Pisco; one overlooking the little town of Ollantay-Tambo, and another at the foot of the terrace of Colcompata at Cuzco. It is very probable that one of these intihuatanas rose before the temple of the sun, and traces of another can still be seen in front of the temple of the island of Titicaca. Their purpose is still very uncertain.



FIG. 170.—The Intihuatana of Pisac.

That of Pisac is one of the best preserved, doubtless on account of its nearly inaccessible position (fig. 170). It is eleven inches in diameter at its base and nine at its summit; it is sixteen inches high, and it is said that but a few years ago it was surrounded by a *champi*¹ collar, which, with so many other interesting relics, has become the booty of tapadas. The whole rock is surrounded with walls, in the shape of the letter D, and made of squared stones, perfectly polished, and hewn in such a manner as to accommodate themselves to every inequality of rock.

¹ *Champi* is the name for Peruvian bronze. Squier: "Peru," p. 525.

Various guesses have been hazarded as to the purpose of the intihuatanas. The most plausible is undoubtedly that representing them to be gnomons, used for measuring the height of the sun.

The fortress of Piquillacta was situated on the south of the possessions of the first Incas, not far from the quarries which supplied the stone for the buildings of Cuzco. A wall seven hundred and fifty feet long by thirty six feet wide at the base, and thirty-four feet high, is still standing to mark its site.

The jambs of the two entrances are of dressed stone, the other parts of rubble-stone, set in clay. Near Piquillacta was the ancient town of Muyna, where the Inca Yahuar-Huacac took refuge in his terror at an invasion of the Chinchas,¹ and where his son Viracocha compelled him to reside, after having conquered the rebels by his courage and bound his brow with the royal llautu.²

On the banks of the Apurimac, which would appear to be the principal branch of the Amazon, on the crest of the buttress of a glacier surrounded by precipices, rose the fortress of Choccequirao, its name, meaning precious cradle, pointing out its purpose, which was to serve as the residence of the heirs to the crown of the Incas. Later, this stronghold was the refuge of the last survivors of the race of Manco-Capac.

Nothing could equal the wild grandeur of these places.³ We are astonished at finding the industry of man gaining a footing on the rocks where the condor had built its eyrie. The first ruins to meet the eye of the traveller are those of the outer circuit of defence. Angrand has suggested that

¹ Garcilasso, *l. c.*, vol. I.

² The *llautu* was a bandage which passed three or four times round the head, and was ornamented with a fringe falling over the eyes. It was black for the members of the Inca's family, yellow for his direct descendants, and the Inca alone had the right of wearing a red llautu. He also wore as insignia the *Masca-paycha*, or red aigrette, and the *capac-ongo*, or royal mantle.

³ Desjardins: "Le Pérou avant la Conquête Espagnole," p. 138 *et seq.* The Comte de Sartiges in 1834, and Angrand, 1847, are the only Frenchmen who have visited Choccequirao, and it is from them we take these details.

the buildings next seen served as a prison, as he had noticed that the doors were closed with stones of enormous weight. A hundred and fifty-three yards lower, following the inclination of the crest, we come to the palace and to the bath-room, in which we can still see the site of the bath, which must have been in gold, as were all the vessels and utensils in use amongst the Incas. Farther on are two buildings which, according to Angrand, were: the one a banqueting-hall, about forty-five yards long by thirteen wide, with windows resembling those of Egyptian monuments; the other, a menagerie. In the walls of the menageries are found projecting stone rings, to which were chained ferocious animals sent to the Incas from all parts of their dominions.

The palace includes three groups of rectangular buildings, two of them about eleven yards broad by sixteen and a half long; the third, eight and a half yards by sixteen and a half; the two first consisting of a ground-floor and one upper story. They are divided lengthways by an internal wall, which forms two elongated chambers on each story. The third building had only a ground-floor, on a level with the upper story of the other two, the terrace crowning it giving access to them.

On the other side of the palace, at a considerable elevation, is a regular fortress, which commands the entrance, and leaves no outlet but four openings made in the walls on the summit of the crest; beyond these four doors are ruins, probably those of a temple.

We might multiply such descriptions, for all over the vast country of the Incas we meet with imposing buildings, often elevated at inaccessible heights. Do the Indians know of other paths than those that the few travellers of to-day dare attempt? This is a point that remains doubtful; but even if practicable routes should be discovered, we shall still be confronted with difficulties apparently insurmountable, though they do not seem to have at all baffled the ancient inhabitants of the country.

More useful works have been preserved as witnesses to the

government of the Incas. Roads intersected the country at a time when there were none in Europe. Two of these roads went from north to south, from Quito toward Cuzco; one, for a distance of 1,200 miles, crossing the sierras and buttresses of the Andes, buried beneath perpetual snow. This was the road followed by Almagro, when he was sent by Pizarro, to bring Chili to submission. The other, finished by the Inca Huayna-Capac, followed the coast, and its length was 1,600 miles. These roads, which Humboldt does not hesitate to compare with the Roman causeways, were from eighteen to twenty-six feet wide; they were protected from landslips by walls of earth, were paved with blocks of stones and in some parts covered with broken stone, a first attempt at macadamizing. They always followed the straight line, crossing the steepest slopes, as the Indians who do not know how to turn by an obstacle still do. The ravines and marshes were crossed by embankments of masonry; rocks were cut through, sometimes for a considerable distance; streams and torrents were spanned by bridges made of the fibres of the aloe, creepers or reeds, the lightness of which was not incompatible with strength. The mode of construction of these bridges, which are still in use, is very simple. Two ropes of maguey or agave fibre a few inches in diameter, pass over masonry piers and are firmly secured at a distance of sixteen to twenty feet from the pier. Vertical ropes are fastened to these cables, and on them rests the platform of the bridge, made of woven reeds. The Peruvians, however, knew how to make masonry bridges. That of Rumichaca, for instance, dates from the time of Huayna-Capac.¹ Here and there, where vegetation was possible, the road was planted with trees, which ensured shade and freshness, and in the mountains, tambos, where the wearied traveller could rest, were built at convenient distances.

Such is the account given by Spanish historians² who

¹ Bollaërt; "Ant. Ethn. and other Researches," p. 90.

² We mention especially Zurate, "Hist. del Descubrimiento y Conquista del

have, however, somewhat exaggerated the importance of these works. Recent researches have established the truth. At certain points of the route, especially in the most difficult parts, the road was not cut, the rock was not levelled, but the direction to be followed to avoid the precipices was merely indicated by stakes. In declivities steps had been made, upheld only by a row of little stones; these are not flights of steps suitable for aiding the ascent, but merely embankments to prevent landslips. As the Peruvians had no beasts of burden, journeys were made on foot, and freight was carried on the shoulders of men. Under these circumstances, these paths, defective as they must appear to us, met all the needs of the inhabitants.

We have already said that water, so precious in tropical climates, was carefully collected in reservoirs placed in elevated situations, and then conducted, by masonry acequias or irrigation canals to distances often of many miles. "I have followed them for days together, and have seen them winding amidst the projections of hills, curving in and out as the topography required; here sustained by high walls of masonry, there cut into the living rock, and in some cases conducted in tunnels, through sharp spurs of the obstructing mountains. Occasionally they were carried over narrow valleys or depressions in the ground, on embankments fifty or sixty feet high; but generally they were deflected around opposing obstacles, on an easy and uniform descending grade" (Squier: "Peru," p. 218). To give a faint idea of what these works were, we mention the valley of La Nepaña, a reservoir made by means of a dam of strongly cemented pieces of rock, shutting in two deep gorges. This reservoir was three fourths of a mile long by a width of half a mile. The walls were eighty feet thick at their base, and could bear the greatest pressure. Wiener also mentions a remarkable hydraulic work, in which large, cisterns, in communica-

Peru," Anvers, 1855, book I., ch. XIII. Consult also Cieça de Leon (ch. XXXVII.), Garcilasso, and amongst modern writers, Humboldt, Rivero, and Tschudi.

tion with each other, conducted at a considerable height the water of the Cerro de Pasco to the Cerro de Sipá.

Constructions of minor importance, but nevertheless of great interest, are to be seen at Huanuco Viejo,¹ where stood a palace of the Incas (fig. 171), and where, according to a tradition perhaps founded on the numerous sculptured pumas ornamenting the walls, the monarchs kept a menagerie. Monumental doors,² somewhat resembling the Egyptian pylones, gave access to these buildings.

Water-works were necessary not only for the food-supply of the population, but also for irrigation. Agriculture was



FIG. 171.—The castle of Huanuco.

held in great honor amongst the ancient Peruvians, and no difficulty deterred them. In the isolated dunes which formed the coast, the sand was dug out to a great depth, until a naturally humid soil was reached, when the trenches were filled with guano, the usefulness of which was already appreciated. The gardens of the Inca, for such is the name given to them, still retain their fertility, and it is on a soil

¹ Huanuco Viejo, a short distance from the celebrated silver mines of Cerro de Pasco, is so called to distinguish the ancient from the modern town, situated sixteen leagues farther to the east. Xeres says that the former was nearly three leagues in circuit. The stones, he adds, were admirably worked and set one upon the other without cement or mortar of any kind. Paz-Soldan: "*Geog. del Peru*," p. 271.

² "These ruins are interesting from the six stone portals, one within the other."—Bollaërt, *l. c.*, p. 199.

thus prepared that grow the richest vines which surround the town of Ica.

In a previous work we remarked¹ that burial has ever been one of the most solemn subjects of thought for humanity, and a religious sentiment has always been connected with funeral honors. To deprive men of burial, said Euripides, is to offend the gods. The history of Peru in its turn tells us the same story; tombs are everywhere numerous, and the modes of burial are most varied. At Chimú corpses were buried in a doubled-up position, and set in the midst of sand, the beds of which gradually decreased in size, so that the necropolis formed a pyramid as it rose.² Near Acora, a little town not far from the lake of Titicaca, the bodies were placed under megalithic stones,³ reminding us of the dolmens and cromlechs of Europe (fig. 172). One vast plain is covered with stones placed erect, some forming circles, some squares, and often covered in with large slabs closing the sepulchral chamber.

These sepulchres are the work of the Aymaras, and they probably date from the period when these people obeyed independent chiefs. All we know of their history is that their chiefs bore the title of *Curacas*, which they retained under the rule of the Incas. Later, as the country advanced, clumsy monuments gave place to more magnificent tombs; hence the towers or *chulpas* which, mixed with megaliths, cover the whole of the plain of Acora. The

¹ "Les Premiers Hommes," vol. II., p. 235.

² Desjardins (*l. c.*, p. 168) describes one of the largest of these sculptures, the Huaca San Pedro.

³ Megaliths are also met with, bearing witness to a more advanced art. Wiener speaks of a cyclopean structure near Vilcabamba, and Squier reproduces an interesting megalith which rises near Chicuito. It is a rectangle sixty feet long, formed of huge blocks of stones driven into the earth, and rising fourteen feet above the level of the soil. There is but one opening, facing east, and marked by two blocks of considerable dimensions. In South America a certain importance is attached to these megaliths. "Pero lo que sin duda es aun de mas importancia, es encontrarse por muchos puntos del territorio Peruano, construcciones en piedra, iguales por el estilo y el carácter á esos cromlechs, dólmenes, círculos del sol o druidicos de la Escandinavia las islas Británicas, Francia, Asia," etc. (Ameghino, vol. I., p. 100).

chulpas consist of a mass of masonry of rough stones and clay, faced with huge blocks of trachyte or basalt. The mass is so put together as to form a cist, in which the corpse was placed; the door, generally very low, always faces east, in honor, doubtless, of the rising sun. Almost all have a cornice near the top, and are set upon a little platform of slabs. Squier mentions one more than twenty-four feet high. An opening eighteen inches square gave access to the sepulchral chamber, which was eleven feet square by thirteen high. He succeeded in getting into it after great difficulties, but only to find that others had entered it before



FIG. 172.—Megalithic tomb at Acora.

him, and to pick up a few remains of human bones and some miserable bits of pottery.

We give a drawing of one of these chulpas, situated in the mountain near the village of Palca (fig. 173). It rises above a trench four feet deep, forming a regular cave, upheld by walls of rough stone. It is sixteen feet high, and at about two feet from the summit is a cornice, formed of *ichu*, a coarse grass, which grows in the mountains, greatly compressed and then cut with the aid of sharp instruments.¹ The masonry is a mixture of pebbles and clay, coated with stucco, and then painted white and red so as to form various

¹ Similar cornices are met with in various places. Squier mentions one at *Tiuhuan*i ("Peru," p. 368).

designs. Human bones, mixed together in the strangest disorder, formed a deposit more than a foot deep in the sepulchral chamber.

The chulpas are generally of square or rectangular form; sometimes, however, we meet with round towers, which by a peculiar arrangement gradually increase in diameter from the base to the summit. The internal arrangements differ no less; some enclose arched vaults, others cists shut in by slabs of stone, or, again, mere niches. Numerous in Bolivia, and in the whole of the basin of Lake Titicaca bounded by



FIG. 173—Chulpa near Palca.

the Andes and the Cordillera, they can be seen in groups, varying from twenty to a hundred, on the sides of the mountains or on isolated rocks; everywhere they form one of the characteristic features of the landscape.

Near Tiuhuani, on the eastern bank of the lake, we meet with two chulpas, each containing two sepulchral cists. They are painted red, yellow, or white, and as rain is extremely rare throughout the whole district, the colors are remarkably well preserved. These double chulpas, regular

family tombs, contained as many as twelve skeletons. In the Escoma valley a chulpa is mentioned, with two sepulchral chambers, each with a separate entrance. It has been excavated several times, and completely stripped by tapadas. Some fragments of human bones alone remain as witness to its original purpose.

Las Casas¹ relates that, at the time of the Spanish conquest, the Peruvians still practised this mode of burial. In certain provinces, he adds, their sepulchres are towers of



FIG. 174.—Earthenware vase from an ancient Peruvian tomb. (One quarter original size.)

massive construction, hollowed out at the height of an estado (six feet). In certain spots they are round, in others square. They are always very lofty, and numerous enough to cover large spaces. Some of the natives built them on eminences half a league and more from towns, so that they look from a distance like populous villages. Every one has a separate ancestral tomb. The dead are wrapped in llama skins, on which care is taken to mark the eyes and mouth; the corpses are then covered with other garments, and

¹ "Hist. Apologetica de las Indias,"

placed in a sitting posture, when the doors of the tombs, which always open to the east, are walled up. In other places the dead are wrapped up as we have described, and then placed in their houses, often among the living. They do not emit any smell, on account of the skins in which they are strongly sewn up, and also on account of the cold, which rapidly mummifies them. The chiefs are put in the place of



FIG. 175.—Vase from a Peruvian tomb. (One fourth natural size.)



FIG. 176.—Vase from an ancient tomb in the Bay of Chacota. (One fourth natural size.)

honor of their dwelling, loaded with the insignia of their rank and the trinkets they affected.

On the coast of the Pacific the modes of burial were different. Near Quito, north of the kingdom of the Incas, the body, reduced to a state of complete desiccation, was deposited in a tomb constructed of stone or adobe, and vases, often of peculiar form (figs. 174, 175, 176), were placed near the corpse. These vases¹ were intended to hold maize or

¹ Some vases of nearly similar form are still used to prepare infusions of

chicha, the latter obtained by the fermentation of roasted maize, which has always been the favorite national beverage.



FIG. 177.—Aymara mummy.

From these tombs have been taken little copper hatchets;

Coca. ("Erythroxylon coca.") An excellent monograph on this plant, by Dr. L. A. Cosse, was published at Brussels in 1861.

looking-glasses, some of polished stone or obsidian, others of metal; pendants for the nose or the ears; bracelets and little figures in gold or silver. In the extreme south of the whole of the valley of Copiapo (Chili) is covered with mound-shaped huacas, measuring as much as twelve feet in height, by twenty or thirty long. Darwin, in his voyage round the world, assisted at the excavation of one of these tumuli, which contained two skeletons, one of a man and one of a woman. (Fig. 177.) Judging from the objects picked up in this tomb, its inmates had belonged to the poorest class. These objects were large earthenware jars of the coarsest workmanship, stone arrow-points, copper pins, and roughly hewn stones, intended for grinding maize.¹

Between these two extremes we meet with other tombs, varying according to the wealth of the survivor. Some huacas near Arica, excavated in 1712, have brought to light mummies wrapped in rich cloth, having beside them vases of gold or silver.² The bodies, mummified by the dryness of the climate, for they show no trace of embalming, were in a sitting posture; several held in the mouth a little golden plaque.³ In 1836, other explorers resumed these excavations on the shores of the Bay of Chacota, a mile and a half from Arica.⁴ The tombs were all of circular form, their diameter varying from three to five feet, and their depth from five to six. They were often surrounded by a cromlech of erect stones, whilst others were surmounted by a mound. All retained traces of large fires lighted after the burial, doubtless in accordance with a sacred rite.

The greater number of these tombs had been violated. Those still intact enable us to judge of the mode of burial; some of the corpses had evidently been dried before inhumation; others were covered with a resinous substance.⁵

¹ "Voyage of the Beagle." Bollaert, *l. c.*, p. 175.

² Bollaert, *loc. cit.*, p. 151.

³ Rivero et Tschudi: "Antigüedades Peruanas."

⁴ J. Blake: "Notes on a Collection from the Ancient Cemetery of the Bay of Chacota"; "Report Peabody Museum," vol. II., p. 177, etc.

⁵ Agassiz mentions mummies preserved by this process at Pisagua. Accord-

All were seated on slabs of stone, the arms folded on the breast, the legs drawn up, and the head resting on the knees. They were clothed in coarse linen cloth, sewn with strong cactus thorns like needles, which were left in the garment. The bodies wore all the objects used during life; men (fig.



FIG. 178.—Peruvian mummy.

178) had their weapons, implements, and ornaments; chil-

ing to Putnam, those from the necropolis of Ancon, are not embalmed by the aid of resinous substances. On this latter cemetery, Wiener ("Peru and Bolivia"), who has excavated numerous tombs, should be consulted, and also the magnificent work by Reuss and Stübel: "The Necropolis of Ancon in Peru."

dren their toys; women,¹ their distaffs filled with wool, and balls of thread, wooden needles, often of great fineness, combs, and several instruments of which the use is unknown; little shells used for money²; bags containing either hair (the last memento given to the dead) or provisions for the long voyage—such as ears of maize or coca leaves. The Peabody Museum owns a regular work-box, containing a woman's implements for needle-work, which was found under a huaca of Peru.



FIG. 179.—Mummy of a woman, found at the Bay of Chacota.

All these objects, thanks to the dryness of the climate, are in a wonderful state of preservation.³ With touching thoughtfulness, the relations of the dead woman, whose remains we figure, had placed near her not only vases of every shape (fig. 174, 175, 176, 180), but also the cloth that

¹ The figure we give (fig. 179), is reproduced from a photograph, prepared after all the objects worn by the woman had been taken off.

² "Littorina Peruviana."

³ "Bull. Soc. Anth.," 1881, p. 550.

she had begun to weave, and which death had prevented her from finishing.¹ Her hair, of a light-brown color, was fine and carefully kept. The legs, from the ankle to the knee, were painted red, a fashion probably dear to Peruvian coquetry, for care had been taken to place near the dead little bladders full of resinous gum and red powder for her toilet in the new life that had begun for her.²

At Iquique, one huaca contained no less than five hundred bodies, all seated and wrapped in long mantles of different colors.³ Some rites are still unexplained; for instance, in



FIG. 180.—Bowl from a tomb at Chacota Bay.

1830, a huaca was discovered surrounded by a circle of red stones, in the centre of which was found the skeleton of a woman, and near her those of four men, on each of which three large stones had been placed. Amongst the numerous objects belonging to this sepulchre, the statuette of a woman is mentioned, with the face of silver.

Pachacamac, as we have said, was a sacred place to the

¹ At Pachacamac excavations have brought to light a loom of half-woven tissue.

² The Galibi women still paint their legs with *Toncou*, a vegetable powder of a fine red, which they dissolve in oil extracted from certain oleaginous seeds.

³ Bollaërt, *l. c.*, p. 179.

ancient inhabitants of Peru, and the temple was a goal of pilgrimage. Its approaches are one vast cemetery, and the sandy soil, impregnated as it is with nitre, has preserved to this day the mummies entrusted to the ground. In some places it is easy to make out three or four layers of bodies; generations of worshippers rest beneath the shadow of the walls that were the object of their adoration. The tombs were made of adobe, and were thatched over with reeds. The bodies were doubled up, or rather coiled round, and then wrapped in very fine cotton cloth, and in coverings



FIG. 181.—Pitcher from an ancient Peruvian sepulchre. (Natural size.)

made from the wool of the vicuña or the alpaca. Here too the tombs contained the most diverse objects. The rich retained their ornaments, but the poor had to be content with a little bit of copper, which served the purpose of the obolus set aside for Charon in the funeral rites of Greece. Wiener, in his excavations at Ancon, found a great number of these little silver or bronze plates placed in the mouths

of the mummies. By the side of each were placed the implements of his profession; near the fisher, net and fish-hooks, near the young girl, household utensils. With the vases always met with in Peruvian sepulchres were often found at Pachacamac roughly cut bits of quartz or crystal, which were, according to Father Arriaga,¹ *Canopas*, the Lares Penates, or gods of the hearth, who were to continue their protection to the deceased in the new life on which he was entering; the canopas, whose duty it was to watch over the family, were always given to the eldest son.

¹ "Extirpacion de la Idolatria del Peru," Lima, 1621.

Leaving the Pacific we find caves, artificially widened if necessary, often serving as burial-places. In the valley of Yucay, as in that overlooked by the fortress of Pisac, the almost inaccessible sides of the mountains are covered with them to a height of several hundred feet; and to this day the few inhabitants of the country call them, in memory of their inmates, *Tantama-Marca*, or the precipices of desolation. The funereal rites were similar to those we have described; the bodies were seated, sometimes wrapped in cotton cloth, sometimes in mere mats, but all have the head resting on the knees; some vases and very rude implements made up all the furniture of the tombs.

In the valley of Paucar-Tambo the rocks had been levelled, and the tombs wrought of dressed stone. They were walled up after the burial, and the stones were covered with a coating of stucco, painted in brilliant colors. The care bestowed on these tombs was an irresistible attraction to the tapadas; they were the first to be violated, and every thing that they contained was dispersed, without any good results for science.¹

Many travellers also mention a cave of some extent, which has received the appropriate name of *Infernillos*.² At the entrance are rude sculptures, representing personages of both sexes. On the walls we notice, several times repeated, the impression of a human hand, traced either with cinnabar or oxide of iron, or yet more simply by the application of an actual hand, wet with a coloring substance. This is the *mano colorado*, of the meaning of which we are ignorant, but which is met with at various points in the two Americas, and also in Australia.³

The Peruvians distinguished the intelligent and immaterial soul (*runa*) from the body, the name of which (*allpacamasca*), animated earth, is characteristic.⁴ They believed in a future life; and the man who had well employed the time of his

¹ Squier: "Peru," pp. 491-531.

² Bollaert, *l. c.*, p. 152.

³ Miles: "Trans. Ethn. Soc. of London," vol. III. *Nature*, May 7, 1881.

⁴ Desjardins, *l. c.*, p. 100.

mortality went after death to the *Hananpacha*, the world above, where he awaited his reward. If, on the contrary, he had led a bad life, he was flung into the *Urupacha*, or world below. This future life, whether happy or unhappy, was to be entirely material. How else can we interpret the very different objects collected in the tombs, among the Aymaras as well as among the Qquichuas, among the predecessors of the Incas, and among the contemporaries of the Spaniards?

The belief in the immortality of the soul, the recompense of the good and the punishment of the wicked, necessarily implies that in the existence of beings superior to man, exercising over him an influence alike during his life and after his death. The Peruvians worshipped, as we have more than once remarked, the sun, the moon, the stars, and thunder. In certain districts the earth was the object of their worship; in others, the sea, the springs, the mountains, chiefly those covered with snow (*rasu*). Stones were also objects of the veneration of the Peruvians. This is explained by one of their traditions, which relates that Viracocha had endowed stones with life, and thus created the first men and the first women.

Side by side with the visible forces of nature existed certain inferior gods: *Papapconopa*, who was invoked to ensure a good harvest of potatoes (sweet potatoes); *Caullama*, the protector of flocks; *Chichic*, who, like the god Termes, ensured respect for landed property; and *Lacarvilca*, who presided over works of irrigation. In other places the dead themselves were invoked as the protectors of their families. These gods were probably the modified representatives of a more ancient fetichism, which have outlived the people among whom it originated. Some less civilized tribes adored animals, such as the condor, the puma, the owl, and the serpent; and even the products of the earth, such as maize and potatoes. But these different people, in submitting to the laws of the Peruvians, were converted, willingly or by force, to the worship of the sun. The wars of the Incas had an essentially religious character,¹ and may be

¹ Desjardins, *l. c.*, p. 95.

compared with those of the Mussulmans, at the time when Islamism, propagated by the sword, spread with such rapidity over whole regions.

Recent investigations have shown that, at a certain period, Peruvian priests taught the existence of a supreme god, a *Deus ignotus*, to whom no temple was dedicated,¹ and whose image none were permitted to make.² He was adored under the name of Pachacamac, in upper Peru, under that of Viracocha at Cuzco; the sun, the moon, and the stars were but the symbols under which he manifested himself to men; animals were his creation, and the fruits of the earth a gift of his bounty. Molina has preserved some very beautiful prayers, addressed to this particular god and creator; they bear witness to the most elevated sentiments in their authors.³ But their authenticity does not seem sufficiently proved; the attributes ascribed to this god are inconsistent with the general state of culture in Peru at that period, and it is probable that, if the idea of one supreme God did exist amongst a few enlightened spirits, the masses identified with this god himself, the symbols which, to the more enlightened, represented his attributes.

The Peruvians offered flowers, incense, animals, such as tapirs and serpents to their gods. At the grand festival of the Raymi or sacred fire, a llama was sacrificed. On certain solemn occasions, such as a victory or the accession of an Inca, for instance, a child or a virgin, chosen for her beauty,⁴

¹ There exists, however, a temple erected in honor of this supreme god, by the Inca Viracocha, to whom he had appeared to command him, on the refusal of his father, Yahuar-Huacac, to march against enemies who had dared to invade the lands of the sun, promising him a decisive victory. Garcilasso has preserved for us a description of this temple, which was destroyed by the Spanish.

² "Relacion Anonym, de las Costumbres Antiguas de los Naturales de Peru."

³ "Saggio della Storia del Chili." Markham: "Narratives of the Rites and Laws of the Incas," published for the Hakluyt Society, London, 1873.

⁴ Garcilasso ("Com. Real," part I., book II., ch. IX.) asserts that human sacrifices had been completely abolished by the Incas, but the contrary is asserted by the Spanish chroniclers, Sarmiento, Montesinos, Balboa, Cieça de

was slain before the image of the sun; but these sacrifices were rare, and they were never followed by the revolting feasts which invariably accompanied human sacrifices amongst the Mexicans.

It is pretended that confession existed amongst the Peruvians, and several Spanish historians¹ agree in asserting this. No one had the special privilege of hearing it; it could be made to all, to men or to women; and the confessor had the right of imposing a penance, according to the gravity of the faults confessed. A certain importance has been assigned to these practices, by connecting them with the dogmas of Christianity. We think, however, that this is merely an interesting coincidence, if true.

The despotic authority of the Incas was the basis of government; that authority was founded on the religious respect yielded to the descendant of the sun, and supported by a skilfully combined hierarchy.² The population was divided into decuries, and amongst the ten individuals who formed each decury, the Inca or his representatives chose one, who became the chief over the nine others. Five decuries had at their head a decurion of superior rank; fifty decuries a chief, who thus commanded five hundred men. Lastly, one hundred decuries obeyed a supreme chief, who received orders direct from the Inca.

Besides this organization, which shared the combined inconveniences of democracy and despotism, were the *Curacas*, or governors of provinces. Some belonged to the family of the Incas; others were descended from the ancient chiefs

Leon, Ondegardo, and Acosta. Their unanimity justifies us in supposing that Garcilasso, as a descendant of the Incas, was carried away in his account by his natural veneration for his ancestors.

¹ "Este vilahona eligia señalaba confesores, paraque así en el Cuzco como en todas las demas provincias y pueblos confesasen secretamente á todas las personas, hombres y mujeres, oyendo sus pecados y dando las penitencias per ellos." The anonymous author of the account from which we borrow these details adds that the confessors of the virgins of the sun were obliged to be eunuchs. See Herrera: "Hist. Gen.," dec. V., book IV., chap. IV. Acosta, *l. c.*, ch. XXV.

² Desjardins, *l. c.*, p. 117.

of conquered countries. Their dignity appears to have been hereditary; it passed to the eldest of the sons, or, in default of children, to the eldest of the brothers. Little is known as to the exact position of the Curacas. In certain cases they were elected by the people, but the election was subject to the approval of the Inca, who could also revoke it.

Penal laws were severe,¹ and were enforced by the sole authority of the Inca. Those guilty of homicide or adultery, those who had dared to blaspheme the sun, or the Inca, his representative, were punished with death. The decurion who did not denounce the crimes committed in his decury was liable to the same punishment as the guilty. The sodomite was flayed, the incestuous hung. Marriage was permitted between relations outside of the second degree. As with the vestals of Rome, the virgins of the sun who broke their vows were buried alive; their house was razed to the ground, and the village or town inhabited by their family shared the same fate. More venial faults were punished with the whip or imprisonment. In other cases the guilty was compelled to carry a heavy stone for a certain time.

Marriage was obligatory; a man could only have one wife; but the Curacas had a dispensation from this rule; as for the Inca, the number of his wives or his concubines was unlimited. He chose them from among the daughters of his race, even amongst his sisters, and among those virgins of the sun who attracted him by their beauty. His choice was limited neither by blood-relationship nor religious respect. When he was tired of one of his temporary partners, the honor of having shared the royal bed followed her in her retreat and she was the object of the respect of all.

On a certain day of each year, the young men of twenty-four years and the girls of eighteen were united in the public square. The representatives of the Inca joined the

¹ "El castigo era riguroso que por la mayor parte era de muerte por liviano que fuese el delito." Garcilasso: "Com. Reales," part I., book II., ch. XII. Ch. F. de Santillan and the anonymous account.

hands of each couple, and proclaimed their union before the people. Such was the only form of marriage; it does not appear that the inclination of the wedded pair was consulted, and generally every one married in his own family. The decury, which none could leave without the express permission of the Inca, was bound to have a home built for each new household, and to assign to it land enough for its support. On the birth of each child, the allowance made was increased by one *fanega* for a boy, and a *half-fanega* for a girl, the exact value of which is unknown. We only know that a fanega was equal to the area which could be sown with one hundred pounds of maize.

This division of the land was modified by an annual revision, and a new partition took place according to the number of the members of each family. This was, as will be seen, a regular agrarian law. Private property, such as we understand it, does not appear to have existed.¹ The Peruvian was simply the farmer for a year of the lot which fate or the will of the decurions assigned to him. Besides the lands belonging to the community, and divisible amongst all its members, there were others, and these not the least important, forming the exclusive property of the Sun or the Inca. The inhabitants had to cultivate the lands, even at their own expense; and none but the sick or infirm could evade this sacred duty.

Llamas were the chief domestic animal of Peru. These animals which, like their congeners, the camels, can exist with the most wretched nourishment and live where other mammals would die of hunger, were valuable in these barren regions. All belonged to the Inca. He chose the shepherds who took them in immense herds into the mountains; and at the time appointed their wool was carried to the magazines built to receive it. A certain quantity of wool

¹ "Rel. primera del Licenciado Polo de Ondegardo," Ondegardo had been corregidor of Cuzco about 1560. Prescott obtained a copy of his reports which were addressed to Philip II., and are preserved in the archives of Simancas. They have since been partly printed, at the cost of the Hakluyt Society of London.

was distributed to each family, according to the number of women contained in it ; and whilst the men were cultivating the ground, the former spun and wove the necessary garments. The women had also to make a certain quantity of cloth which was stored away as a reserve for the unforeseen needs of the community. The dwellings of the Peruvians were in harmony with the position of their inhabitants. Except that of the Incas or of the Curacas, all appear to have been built on the same model¹ ; the rooms had no communication except by outer doors opening upon a cor-



FIG. 182.—Sepulchral vase from a huaca of Peru.



FIG. 183.—Peruvian vase representing a man squatting on the ground.

ridor, which ran along the whole length of the building, and which may be compared with ancient cloisters. Some of the roofs had a double² slope resting on lateral walls with two gables, on which were carried cross-pieces formed of cane, which were covered with agave leaves, maize-straw, and sometimes even with mats.

The organization above described guaranteed the undisputed authority of the supreme master. Each in-

¹ Comte de Sartiges : *Rev. des Deux Mondes*, 1851.

² Wiener, *l. c.*, p. 503.

dividual formed part of a clan, which he was forbidden to leave.



FIG. 184.—Peruvian vase.

He could not ameliorate either his own position, or that of those belonging to him; nor could he sink beneath it. Hence the motives which most powerfully move man, such as patriotism, ambition, the desire of wealth and the spirit of invention, were altogether wanting. Public spirit could not develop, and this is the best explanation of the strange rapidity with which a few Spanish adventurers reduced to submission a population of several million souls.

Peruvian pottery was equal in execution to the best made by the other races of America. The potter's wheel appears, however, to be unknown, and the regularity that the workmen obtained without the employment of mechanical means



FIG. 185.—Piece of Peruvian pottery, representing a llama.

is astonishing. In the archæological museum at Madrid may be seen a very complete series of vessels from the Pacific coast, some intended to be put on the fire and others for use at table, or in the different apartments. The forms

are extremely varied, from the clumsiest vessel, reminding us of the lake pottery of Europe, to ewers of excellent workmanship, representing men, animals, and a curious series of plants, the study of which will enable us to recognize many species of the ancient flora of the country.

This pottery¹ was black, gray, or red, more rarely yellow or blue,² baked in a kiln,³ and covered outside with a permeable varnish, probably silico-alkaline. Some have attributed this varnish to polishing when cold; but Demmin has proved that it was obtained by means of baking, for he could not get it off, either with spirits of wine or volatile oil.

The vases were moulded in two pieces, and joined before baking; so that they often show a swelling at the joint. The form was often ovoid (fig. 176), and a special stand was absolutely necessary to keep them upright. The ornamentation has an originality of its own; it is less simple and more involved than that of the Mexicans. Some vases are, however, decorated with Greek frets, loz-



FIG. 186.—Piece of Peruvian pottery.

enges, chevrons, spirals, or concentric circles (figs. 174, 175, 182). The Louvre possesses a remarkable piece, of Peruvian origin, unfortunately hidden away for many years in the reserve collection.⁴ Its ornaments bear witness to a singular parallelism between Greek and American art. The reserve collections of the Louvre also contain another piece of pottery

¹ Desjardins, *l. c.*, p. 171. Wiener: "Peru and Bolivia," p. 620, *et seq.*

² Demmin: "Guide de l'amateur de faïences ou de porcelaines." 3d. edition, Paris, 1867. Barnard Davis, Anth. Institute of Great Britain, April, 1873.

³ Bollaërt (*l. c.*, p. 210) says that the pottery was baked in the sun, and that the use of the kiln was unknown. This is an evident error.

⁴ Demmin, *l. c.*, p. 134. Birch: "Ancient Pottery," vol. II., p. 253.

from the Pacific coast, the design of which reminds us of Hercules struggling with a fish, a subject so often reproduced by the Etruscans. At the ethnographical museum of St. Petersburg we may also see a squatting figure rather more than a foot high, of which the disproportionately long ears recall the Orejones, whilst the head is surmounted by a mural crown resembling that worn by certain antique

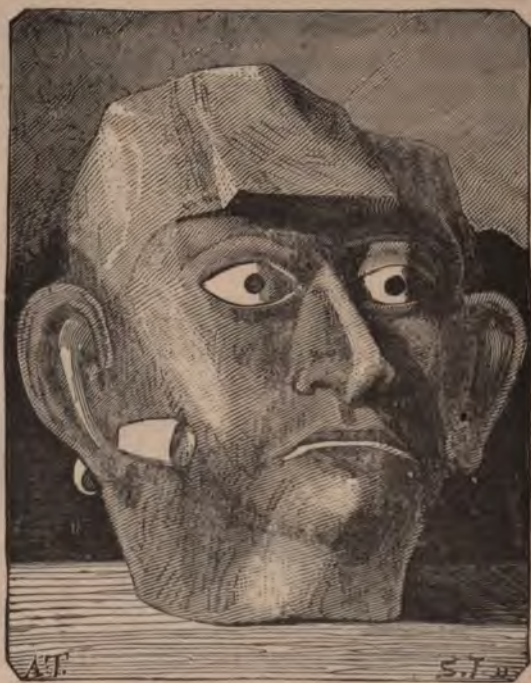


FIG. 187.—A vase found at Chimbote.

statues.¹ There is indeed not a single Peruvian collection, public or private,² which does not contain types curiously re-

¹Schobel: "Antiquités Américaines du Musée Ethnographique de Saint Petersburg." "Cong. des Americ.," Nancy, 1875, vol. II., p. 273.

²The Macedo collection, recently acquired by the Prussian Government, contains numerous types of animals. Many are reproduced in the *Nouvelle Revue d'Ethnographie* (1882, No. I), which, under the skilful direction of Dr. Hamy, is destined to render real service to science. The Louvre Museum also pos-

sembling those which have wrongly been supposed to be exclusively characteristic of the Old World.

Numerous pieces of pottery represent men (figs. 183, 184), animals in familiar attitudes (figs. 185, 186); a llama, for instance, eating an ear of corn.

The Peabody Museum possesses fifty-one pieces from the Agassiz collection, among them several representatives of monkeys, and three human figures, from thirteen to seventeen inches in height. Two vases found, one at Chim-



FIG. 188.—Earthenware vase found under a huaca near Santa.



FIG. 189.—A silvador.

bote (fig. 190), the other under a huaca near Santa (fig. 188), are remarkable. The first is the work of the Chimus, and dates from the time of the domination of the Incas, for the ears are distended by an ornament dating from the same period; the second is a human figure in red clay, of a very characteristic type.

sesses, in one of its public rooms, a valuable collection of statuettes of men and animals. De Longpérier: "Notice des monuments exposée dans la salle des Antiquités Américaines," Nos. 658, *et seq.*

The silvador (fig. 189), for such is the name given to a piece of pottery preserved in the Trocadero Museum, deserves special mention, if only on account of its originality. It consists of two vases with necks communicating



FIG. 190.—Piece of painted pottery representing a vicuña hunter.

with each other.¹ One only of these necks is open, and when liquid is poured into it, the compressed air in the other escapes with a peculiar whistle; by a skilful contrivance the

¹ J. Bertillon : *Nature*, 10th June, 1882. Wiener reproduces a certain number of silvadors; they resemble the Etruscan *nasiternes*, and yet more the double jars which are still manufactured in Kabylia.

sounds are modified so as to imitate the cries of different animals, and even the human voice. On the mouth of one vase, of which we give a drawing, is a little figure fairly well executed, representing a man holding a tomahawk, the most formidable weapon of the ancient Peruvians.

Some pieces of pottery are ornamented with subjects the execution of which is generally very inferior; and we even wonder if the vicuña hunter (fig. 190) is not actually a caricature. Some of these paintings are certainly symbolical, but their interpretation is purely conjectural; others are more obscene,¹ and, singularly enough, many of them have been picked up under huacas, mixed with human bones.



FIGS. 191 and 192.—Disks intended to be used as ear pendants.

¹ "From the north of Peru I have seen clay figures characterized by a prurient indecency," Bollaërt, *l. c.*, p. 211.

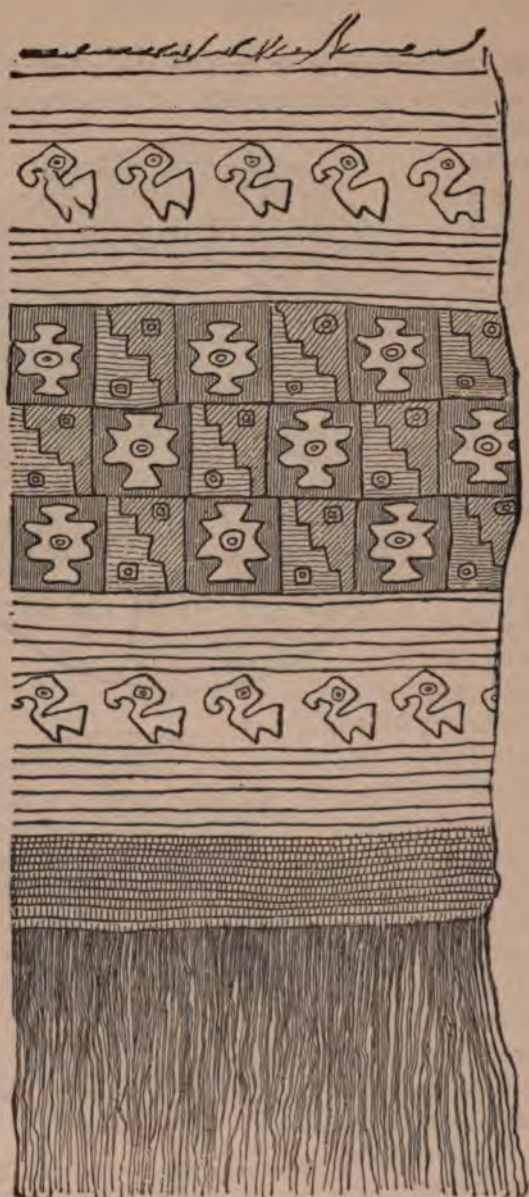


FIG. 193.—Peruvian cloth.

Like the Mexicans, the Peruvians made of earthenware musical instruments, such as shepherd's pipes or trumpets, and ornaments of all kinds, especially heavy disks (figs. 191, 192), intended to be worn in the ears, and producing by their weight the grotesque forms characteristic of the subjects of the Incas.

No American people has surpassed the Peruvians in the manufacture of woven tissues. The cotton they cultivated in the warm and humid valleys, with the wool of llamas, alpacas, and vicuñas, supplied excellent material. They knew the art of dyeing, the stuff was often woven in wool of different colors, and by this means the most varied designs were obtained in the wool (fig. 193). The cotton cloths, generally of great fineness, were dyed in different colors; and the workmen knew how, by combinations of



FIG. 194.—Die for cloth printing.

ornaments or figures, to obtain the most happy results. For this purpose they used regular stamps, sometimes of bark, sometimes of earthenware (fig. 194); they also added feathers of brilliant colors, tastily shaded, and the garments of the Incas and Curacas, with their undulating colors, excited the enthusiasm of the first Spanish chroniclers. Many interesting specimens of these Peruvian stuffs may be seen in the British Museum, and were described several years ago by Bollaërt.

In the Louvre and Trocadero museums may also be seen

fragments remarkable for the variety of the combination and the natural taste of the workmen. One is really amazed at the results which they obtained, in spite of the obstacles to industry presented by their form of government.

The rich mines of Peru, and especially those of Pasco, so celebrated, retain traces of ancient mining operations, the epoch of which it is difficult to determine. One thing is certain: the artizans who worked the precious metals had attained the skill which time alone can give.



FIG. 195.—Silver vase discovered at Chimú.

Although a great many objects have disappeared in the crucible, there still remain enough bracelets, pins, tweezers, and vases, with ornaments in relief (fig. 197) to prove the talents of their jewelers. The statuettes are even more remarkable; they include lizards, serpents (fig. 196), monkeys, birds with their feathers, fish with their scales, trees with their leaves; modelled some in relief, others in intaglio. The artist did not even shrink from attempting to represent complete groups. We may mention a child lying in a

hammock, on which a serpent coiled round a tree is about to fling itself, and a man seated between two women. The latter, which belonged to Squier's collection, weighed forty-nine ounces. Unfortunately, it is impossible to give an illustration of it. If it is true, as has been claimed, that the Peruvians were ignorant of the art of casting metals, the only process known for the production of such complicated pieces was an amalgamation of gold with mercury, which latter metal is very common in the country, and known to the Indians of the present day. The paste made by a mixture of the two is very plastic, and lends itself easily to modelling; when the artist had finished his work, he volatilized the mercury, by exposing it to a fierce heat; the gold alone

was left, and simple polishing was enough to obtain the desired result. Cieça de Léon¹ relates that the working of metals was a speciality of the men of Chimú, and adds that after the submission of the country the Inca Yupanqui carried off to Cuzco the best workmen of the town.

We must also refer to several little round pieces of gold, silver, or copper, pierced with a hole, and bearing on one side a rough impression either of a man or an animal. Were those used as money? There is nothing to justify us in supposing that these men had invented a system of exchange, unless for their simple wants; and it is more probable that these were ornaments resembling those of



FIG. 196.—Silver serpent.

gold, silver, earthenware, stone, and glass found under the huacas (fig. 197).

Iron appears to have been unknown to the Peruvians as to the other inhabitants of America. It was replaced by bronze, or copper, and a considerable number of weapons, tools, implements, and ornaments, made of one or other of these metals, have been picked up. The copper was mixed with from five to ten per cent. of silver.² This may have been an alloy, or more probably a natural product of the mine. Some writers have pretended that the Peruvians were acquainted with

¹ Cieça de Léon, one of the companions of Pizarro, remained for seventeen years in Peru. His history "*Primera parte de la chronica del Peru*," was printed at Seville in 1553 and at Antwerp in 1554.

² We have mentioned this same fact with regard to the copper extracted by the Mound Builders from the mines of Lake Superior.

a mode of hardening which added to the power of resistance of copper. None of the objects thus far discovered justify this assertion. At the Madrid exhibition was to be seen a bronze statuette rather more than six inches high, representing a man with his legs crossed, seated on a tortoise, and his arms resting on a tablet, on which is traced an inscription. This statuette was taken from a huaca at the foot of the Andes.



FIG. 197.—Beads of gold, silver, earthenware, stone, and glass.

The spade and chisel used by the ancient Peruvians were of the form still retained in the country. The celts resembled the stone ones of Europe; the knives, those still in use amongst French saddlers. Sometimes the tools were more clumsy; Darwin speaks of having seen rough stones, pierced with a hole to receive a handle, used by the inhabitants of Chili to till, or rather to scratch, the ground.

The weapons found are generally of the most wretched

description, and include lance-points,¹ javelins, arrows, and bronze tomahawks. Near the mines of Pasco especially have been picked up hatchets and arrow-points of flint, obsidian, diorite, and basalt, and stone mortars resembling those of California.

The Trocadero museum contains several stone batons, which have been supposed to be insignia of rank,² presenting a curious relationship with those objects, alleged to be of that character, of neolithic times in Europe. It is probable, however, that none of these objects had any such purpose. The idea of "rank" can hardly have developed among neolithic men any more than among the present Eskimo. Objects obtained from the Eskimo of Nunivak Island by Dall, in 1874, exactly resemble some of the so-called batons of neolithic man, and were handles for skin scrapers, or snuff pestles. We give a drawing of a rod (fig. 198) of interesting workmanship,³ with seven birds sculptured along it, that appear to be climbing toward the top, which is crowned by two birds said to be pelicans. We may also mention, as a specimen of wood-work, a seat upheld by two pumas, found at Cuzco (fig. 199), and some four-legged stools cut in a single piece of wood. These stools figured at the Madrid exhibition; they resemble in shape the seats represented in Mexican pictographs. Wood was also used to make many objects in daily use. For instance, several examples of tastefully carved combs (fig. 200) are known. Such combs were nearly always placed in the huacas, near the dead.

To conclude our summary of all relating to the Peruvians, we must describe the *Pintados*; such is the name given to the engravings and sculptures met with upon the granite rocks of the chain of the Andes.⁴ These represent men, some of

¹ Squier has in his collection a lance-point twenty inches long.

² It is remarkable that the insignia of rank have invariably developed from an ordinary stick or club. Such was the origin of the sceptre of the kings, the crozier of the bishop, and the baton of the marshal of France.

³ *Nature*, 10th June, 1882.

⁴ Bollaert, *l. c.*, p. 157. "Trans. Ethn. Soc. of London," 1857.

which are thirty feet high, animals, chiefly dogs and llamas, plants and inanimate objects. One block of granite twelve

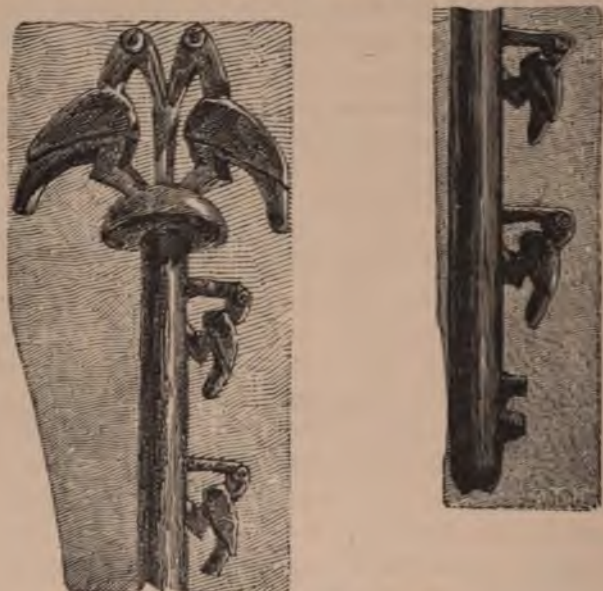


FIG. 198.—Carved rod from Peru.



FIG. 199.—Seat of maguay wood found at Cuzco.

feet square near Macaya, known by the name of *la Piedra del Leon*, is loaded with very ancient sculptures. The most

important group represents a struggle between a man and a puma.¹ On another rock it is easy to make out a puma. Near the little town of Nepeñ, a colossal serpent is to be seen; at Caldera, a short distance from Arequipa, trees and flowers. At the Pintados de las Rayas, near Noria, it is no longer animate objects, but geometrical figures, such as circles or parallelograms, that are met with. In the province of Tarapaca, considerable surfaces are covered, not only with figures of men and animals, most of them of remarkable execution (fig. 201), but also with characters, which appear to be written vertically. The lines are from twelve to eighteen feet high, and each character is several inches in depth. Near Huara half-effaced inscriptions are reported, and between Mendoza and La Punta, Chili, is a large pillar, on which are marks supposed to be letters. Their indefinite character may be judged from the fact that they have been said to present some resemblance with Chinese characters.² Every thing relating to these so-called inscriptions is very vague, very uncertain, and does not justify any conclusion.



FIG. 200.—Peruvian comb.

I am disposed to attach more importance to the discoveries of Professor Liberani, in the Santa Maria valley, Province of Catamarca, in the Argentine Republic.³ He describes figures of animate objects accompanied by reproductions of inanimate objects, geometrical figures, and lines of

¹ Bollaërt, *l. c.*, p. 102.

² Bollaërt, *l. c.*, p. 218.

³ Ameghino: "La Antigüedad del Hombre," vol. I., p. 94.

dots differently combined. The same signs are met with, and this is a fact worthy of attention, constantly repeated and always in a similar order. Ameghino considers these inscriptions to indicate a complete system of writing, made up partly of figures and symbolical characters, partly of purely phonetic characters; and he is even disposed to admit that these are the remains of ancient Peruvian writing, which has been perpetuated far from the district where it first came into existence. According to Montesinos,² this writing was proscribed by Pachacuti III., one of the fabulous predecessors of the historic Incas; he even had an *amauta* burned for having dared to infringe his orders.³



FIG. 201.—Peruvian pictograph. Province of Tarapaca.

It is certain, that in the sixteenth century the Peruvians were acquainted with no system of writing, either hieroglyphic or phonetic, and with no mode of numeration. It is in the highest degree incredible that a system of writing should have been so utterly lost if it had ever existed. For the

¹ "Mém. hist. sur l'ancien Pérou," coll. Ternaux-Compans, Paris, 1849.

² "Uno de los reyes del Peru prohibio en efecto su uso bajo las penas mas severas, y uno de sus subditos que algunos años mas tarde se propuso inventar un nuevo sistema de escritura fu quemado vivo." Ameghino, *l. c.*; consult the same author's "Inscripciones ante colombianas encontradas en la Republica Argentina," 8°. Brussels, 1880.

ordinary purposes of life they used *quipos* (fig. 202), or strings of varying length, on which were knotted a certain number of threads. The color of the threads and the number and distance from each other of the knots had a significance sometimes historic and sometimes mathematical.¹ Garcilasso tell us that the quipos, which related to the history of the Incas, were carefully preserved by an officer called *Quipo Camayol*, literally the guardian of the quipos. The greater number were destroyed as monuments of idolatry

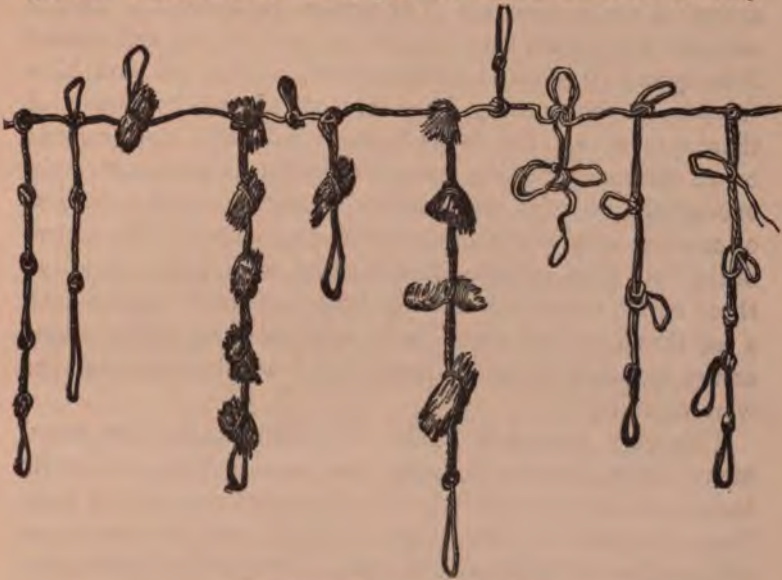


FIG. 202.—Fragment of a quipo.

by some fanatical friars, but their loss is not important to history, as neither tradition nor study enable us to interpret those still remaining. The Indians, however, long preserved, and perhaps still retain, this system of secret correspondence.

¹ Before the accession of the Emperor Fo-Fli (3,300 B. C.), it is said that the Chinese were not acquainted with writing and also used quipos. In the writings of Confucius we find a passage which bears on this point. "The men of antiquity," he says, "used knotted cords to convey their orders; those who succeeded them substituted signs or figures for these cords." Jaffray: *Nature*, 1876, vol. II., p. 405.

A great revolt against the Spaniards was organized in 1792. As was found out later the revolt had been organized by means of messengers, carrying a piece of wood in which were enclosed threads, the ends of which formed red, black, blue, or white fringes. The black thread had four knots, which signified that the messenger had started from Val-dura, the residence of the chief of the conspiracy, four days after full moon. The white thread had ten knots, which signified that the revolt would break out ten days after the arrival of the messenger. The person to whom the keeper was sent had in his turn to make a knot in the red thread if he agreed to join the confederates; in the red and blue threads, on the contrary, if he refused. It was by means of these quipos that the Incas transmitted their instructions; on all the roads starting from the capital, at distances rarely exceeding five miles, rose *tambos*, or stations for the *chasquis* or couriers who went from one post to another. The orders of the Inca thus became disseminated with great rapidity; those which emanated directly from him were marked with a red thread of the royal *llantu*, and nothing, as historians assure us, could equal the respect with which these messages were received.¹

This very imperfect mode of communication presented many other drawbacks, when the preservation of historic facts and their transmission to posterity was in question. From this point of view, it was certainly very inferior to the pictographs of the Mexicans, to the hieroglyphic system employed in Yucatan and Chiapas, and even to the clumsy representations of the North Americans; it offers a strange contrast with the progress in many directions characterizing the Peruvians.

We cannot conclude our account of Peru without again laying stress on the admiration with which the historian and philosopher are inspired in studying an organization so strange and a culture so advanced as that of the population who braved the severe climate of the Andes and the burning

¹ Prescott: "History of the Conquest of Peru," p. 29.

sun of the Pacific coast. We shall recur again to the origin of this civilization, but, before touching that question, we must complete our work by studying the other peoples of South America.

On the lofty table-lands which form the chain of the Andes, in N. Lat. 4°, at an elevation of nearly ten thousand feet, lived the Chibchas.¹ This was a strong and courageous, agricultural and industrious race, individual in character, and possessing an original culture. Isolated in the narrow area which formed their country, they knew how to maintain their independence against their more powerful native neighbors, who resembled them in manners, customs, arts, and worship. After the Spanish conquest, however, the Chibcha country, which consisted only of a territory forty-five leagues long by twelve to fifteen wide, became the province of Cundinamarca, and was included in the viceroyalty of New Grenada. Since 1861, the state of Cundinamarca has formed part of the confederation which has taken the name of the *United States of Colombia*.

Less advanced perhaps, than the Aztecs or the Peruvians, the Chibchas were yet able to lay out and pave roads, to span their water-courses with bridges, to build temples with columns to their gods, to carve statues, to engrave figures on stone, to weave and dye cotton and wool, to adorn their woven tissues with varied patterns, and to work in wood, stone, and the metals. Their pottery resembled that of other people of America; their vessels are generally formed of three super-posed layers; the central layer is black, whilst the internal and external ones are of finer earth and lighter color. The ornaments of the Chibchas

¹ Piedrahita: "Hist. gen. de la conquista del Nuevo Reyno de Granada," Madrid, 1688. Humboldt: "Voyage aux régions équinoxiales," etc., and "Vues des Cordillères." J. Acosta: "Compendio hist. del descubrimiento y colonización de la Nueva Granada," Paris, 1848. Bollaert: "Ant. Ethn. and other Researches in New Granada," London, 1860. Uricochœa: "Mem. sobre las antigüedades Neo-Granadinas," Berlin, n. d. *Nature*, 1877, vol. I., p. 359. "Isographia física y política de los Estados Unidos de Colombia," Bogota, 2 vols., 1862-3. Dr. Jaffray: "Voyage à la Nouvelle Grenade," "La Tour du Monde," vol. XXIV., XXV., XXVI.

were collars made of shells which came from the coasts of the Pacific, more than two hundred leagues off; gold, stone, and silver pendants, pearls, and emeralds. Their wealth was considerable, and chroniclers relate, that in the first few months succeeding the conquest the conquistadores collected spoil of which the value exceeded thirty million francs.¹ If these figures are not exaggerated they are really enormous for the time and country.

We know very little about this people, who are looked upon as one of the authors of the ancient civilization of South America. Their very language has disappeared,² and the name by which we know them dates from the time of the Spaniards,³ who borrowed it from Chibchachimi, one of the chief gods of the country, the protector of agriculturists and goldsmiths. The traditions relating to the Chibchas are of little importance. According to Chibcha legend the moon was the wife of Bochica, who personified the sun; she did as much harm to men as he did good, and Bochica, irritated against her, condemned her to give light to the earth only during the night.⁴ They called themselves aborigines, born before the moon was created, on the tableland where Santa Fé de Bogota now rises. They wandered about naked, without laws and without culture, until a stranger, Bochica, came from distant regions and taught them the art of clothing themselves, building houses, and living in society. The legends relating to Bochica present a curious analogy with those about Quetzacoatl or Manco-Capac, and, by one of those coincidences of which ethnology affords so many examples, the mythical civilizer of Colombia had something in common alike with the reformer of Buddhism and the first Inca of Peru.

¹ Acosta, *I. c.*, pp. 123 and 126.

² In 1871 Uricochœa published a Chibcha grammar. This language, he tells us, can only be studied now through two others, which are probably only dialects of it, that of the Turievos, a people who lived north of Bogota, and that of the Itocos, who lived near the celebrated emerald mines of Muzo.

³ The Chibchas are supposed to have called themselves Muyscas, a word signifying *men* in their language.

⁴ Desjardins: "Le Pérou avant la conquête Espagnole," pp. 44 and 102.

Besides their own particular gods, such as Chibchachimi or Nehmquitiba, the Chibchas also adored the sun and the moon; they offered human victims to the sun, but only on rare occasions. One of these occasions was the commencement of each cycle of fifteen years, which formed the basis of their astronomical calculations; and with a cruelty but little in accordance with their habitual manners, the victim was often chosen several years beforehand, and prepared by a long initiation for the death which awaited him. The lofty summits of the mountains, the water-courses, and the lakes were dedicated to their divinities. Among the lakes, that of Quatavita was the most venerated, and it is related that at the time of the conquest the inhabitants flung into its waters all their treasures that they might not become the prey of the conqueror, the report of whose avarice had already reached the Chibchas. This legend, which does not agree at all with the account of the immense sums drawn by the Spanish from New Grenada, has shown great vitality. At various times the tapadas have endeavored to recover these riches but the results have by no means corresponded with the hopes of the explorers; in 1562, one alligator, two monkeys, and thirteen frogs of gold were taken from the water; but more recent attempts have yielded but a few statuettes of no value.

Not far from Tunja, in the state of Boyaca, thirteen columns, four or five yards high, still stand; a little farther off, near some extensive ruins, rise nineteen shorter columns¹; numerous carved stones covered with ornaments are scattered all over the coast for a distance of more than two miles. It is supposed that this was the town of Sogomuxi, and the temple, of which the columns are relics, would be that of Nehmquitiba, which was destroyed by Quesada.

Although belonging to one race, the Chibchas do not appear to have formed a national body. Some obeyed a

¹ "Bull. Soc. Géog.," 1847. Travellers differ as to the number of columns still standing. See Jaffray: "Viaje a nueva Granada." Ameghino: "La Antigüedad del Hombre," vol. I., p. 103.

chief called *Zippa*, who commanded at Bogota; the chief of the other faction bore the title of *Zoque*, and lived at Hunsá, the Tunja of to-day. The authority of these chiefs was as despotic as that of the Incas, and no one dared to oppose their will. The *Zippa* could only have one legitimate wife, but was allowed any number of concubines (*Thiguyes*). None of his sons inherited the paternal power; but, in accordance with a custom which still prevails in the heart of Africa, it was transmitted to the eldest son of the sister.

As soon as the *Zippa* was dead, his viscera were taken out and replaced by sweet-smelling resin; the body was then placed in a coffin of palm-wood, ornamented inside and out with sheets of gold. This coffin was placed in a sepulchre, the situation of which was secret; and this secret has been so well kept that to this day the tombs, so eagerly sought after, have never been discovered. Such is the account, bearing the impress of their habitual exaggeration, which we borrow from the Spanish writers. It is probable that the cave situated not far from Bogota, and which has yielded such an ample harvest of jewels of gold and silver, or perhaps that near Tunja, where rows of mummies clothed in rich garments were to be seen, was really the spot dedicated to the burial of the *Zippas* and the *Zoques*. With the chiefs were interred their weapons, their garments, the insignia of their rank, and even those of their favorite concubines. In all the tombs, without exception, we find the objects that had been used in daily life, the professional implements, and jars filled with *chicha*. For these men, as for the greater number of the native people of America, the life which began after death was to be a continuation of that lived upon earth.

The laws of the Chibchas were no less severe than those of the Aztecs or the Peruvians. Violation and homicide were punished with death; the thief incurred the penalty of the whip. Sometimes the penalties inflicted were more original; he who showed cowardice in war was dressed like

a woman, and made to do female work. The woman accused of adultery had to swallow a certain quantity of red pepper; if she confessed her fault, she was pitilessly put to death; but if she could stand the ordeal, her husband had to make public apologies to her.

These men had no cattle of any kind; they do not appear even to have known how to make use of llamas. Their food consisted of honey, which was very abundant on the slopes of the mountains, maize, and potatoes, which they obtained by cultivating the earth with wooden implements, and watering it frequently by means of irrigating canals. Their houses rose in the midst of circular enclosures (*cercadas*) often defended by watch-towers. They were built of wood and clay moistened with water; the roof was conical, and covered with reed mats. The openings were closed with interlaced rushes.

Primitive as their buildings and their mode of life appear, the Chibchas were acquainted with bronze, copper, tin, lead, gold, and silver, but not with iron. They were very skilful in the use of the metals just enumerated, and their chief occupation was the fabrication of gold and silver objects. In the Saint Germain Museum may be seen interesting specimens of Chibcha art (fig. 203). M. Uricœchea has a still more remarkable collection, amongst the contents of which we must mention two golden masks of the human face, larger than life, and hundreds of little statuettes representing men, monkeys, and frogs. The last-named are numerous throughout New Granada, from which we may gather that the veneration of the Muyscas for water-courses extended to the batrachians peopling them.

The Chibchas appear to have carried on an extensive trade in the various objects they manufactured; they also exported to their neighbors the rock salt which abounded in their territories, and in return they received the cereals which the poverty of their soil rendered indispensable to them. They are said to have invented a coinage to facilitate these exchanges, and that it was for this purpose that

were made certain peculiar little gold discs; it is more probable that these were ornaments, for nothing that we know of the social state of the people of South America justifies us in supposing that they understood the use of money.



FIG. 203.—Chibcha weapons and jewels. (Saint Germain Museum.)

Monuments, except the columns already mentioned, are rare in the Chibcha country, and we can enumerate them rapidly. A stone is mentioned, probably intended for sacrifices, and upheld by caryatides; a sculptured jaguar at the

entrance to a cave near Neyba, and further on some gigantic llamas. Humboldt mentions, at the entrance to the Muysca country, between 2° and 4° N. Lat., granite or syenite rocks, covered with colossal figures of crocodiles and tigers. They look as if they were intended to defend the representations of the sun and moon accompanying them. Ameghino also speaks¹ of hieroglyphics in New Granada, and perhaps we must also attribute to the Chibchas two columns of great height, covered with sculpture, situated at the junction of the Carare and Magdalena. They are the object of the superstitious veneration of the natives.²

Every day, so to speak, brings new facts which add to our knowledge. We must not omit to mention the curious pictographs recently discovered in the valleys of Bogota, Tunga, and Cauca, which appear to be a roughly outlined map of the country, in which, however, the nearest pueblos can be made out.³

At every turn South America presents vestiges of a vanished race, of a culture now lost; and we are always compelled to one conclusion as to our absolute powerlessness to decide on the origin or cause of the decadence of these races, now represented by a few miserable savages, without a past, as without a future.

In no region of the globe has nature been more prodigal than in the vast districts stretching from Guiana to Uruguay, from the Atlantic to the foremost spurs of the Andes, forming the empire of Brazil. The fertility of the soil, under the double influence of heat and moisture, is wonderful; forest trees grow in great variety everywhere; valuable medical plants spring up in profusion which are not to be met with in any other climate; and vegetables, good for food, or fruits pleasant to the palate of man, with flowers of the most brilliant colors. Fifteen thousand vegetable species peculiar to Brazil have already been recognized. Agassiz, telling of

¹ "En Nueva Granada las inscripciones geroglificas se encuentran á cada paso." "La Ant. del Hombre," vol. I., p. 92.

² Zamora: "Hist. de la Prov. del Nuevo Reino de Granada."

³ Bastian: "Zeitschrift der Gesellschaft für Erdkunde," Berlin, 1878.

his memorable expedition to the Amazon, in 1865 and 1866, adds: "An empire might esteem itself rich in any one of the sources of industry which abound in this valley, and yet the greater part of it rots on the ground, and goes to form a little more river-mud, or tinges the water on the shores of which these manifold products die and decompose."¹ The fauna is no less rich than the flora; virgin forests, the magnificence of which, according to travellers, baffles description, are filled with monkeys and feline animals, tapirs, peccaries, and birds of brilliant plumage. The abundance of fish in the streams and rivers is no less remarkable; in fact, the Brazilian ichthyology is so rich that, in his exploration of the Amazon, Agassiz was able to class three hundred new species. The pirarucu (*Sudis gigas*), which the natives take with the lance when it comes to the surface of the water, and the sea-turtle alone, would suffice for the nourishment of a large fish-eating population.²

The barbarism of man presents a strange contrast with the riches of nature. Whilst powerful and industrious people, with regular government, laws, and towns, flourished upon the sandy coasts of the Pacific and on the lofty tablelands of the Andes, at heights where cold and hunger were formidable enemies, the Portuguese found in the fertile dis-

¹ "A Journey in Brazil," Boston, 1868, p. 510.

² Prince Max de Neuwied: "Reise nach Brasilien," 3 vol., 4°, Frankfurt-am-Main, 1820. A. de St. Hilaire: "Voyage dans les provinces de Rio de Janeiro et de Minas Geraës." F. Denis: "Le Bresil, Univers Pittoresque," Paris, 1837. F. de Castelnau: "Exp. dans les parties centrales de l'Amérique du Sud, de 1843 et 1847," 6 vol., 8°. A. de Varnhagen: "Hist. Geral do Brazil," Madrid and Rio de Janeiro, 1855-7. Dr. T. Waitz: "Anthropologie der Naturvolker," vol. III., Leipzig, 1862. C. de Martius: "Beitrag zur Ethnographie und Sprachenkunde Amerikas zumal Brasiliens," Leipzig, 1867-72. Marcoy (St. Cricq): "Voyage à travers l'Amérique du Sud, de l'Océan Pacifique à l'Océan Atlantique," Paris, 1868. R. Burton: "Highlands of Brazil," London, 1868. Hartt: "Geology and Physical Geography of Brazil," Boston, 1870. Pompeu de Souza: "Compendio de Geographia geral e especial do Brazil." Lacerda and Peixotto: "Contribuições ao estudo anthropologico das Raças indigenas do Brazil." "Archivos do Museo Nacional," Rio de Janeiro.

tricts of Brazil but a scattered population, steeped in the saddest degradation,¹ and where cannibalism has continued to exist to our own day.²

This native population belonged to the race called Guarani by the Spaniards and Tupi by the Portuguese. This was the most prolific race in South America.³ We meet with it in the Antilles, in Uruguay, in Guiana, and as far as Bolivia. The skin of the Guaranis was a shade less dark than that of the Aymaras or the Qquichuas; they were of more robust and vigorous constitution; but, on the other hand, their character was more violent, and their intelligence was less marked, and above all, less susceptible of progress.

Dr. Crevaux, of whose murder by the Tobas we have just heard, and whose death is a great loss to science, noted important analogies between the languages of Guiana, the Upper Amazon, the Antilles, and that of the ancient inhabitants of the bay of Rio de Janeiro. This is a weighty fact in support of the opinion that a single race peopled all the Atlantic coasts of America.⁴ But this race has been pro-

¹ Varnhagen estimated the number of natives at the time of the Portuguese conquest at about a million. The different tribes which have remained in a savage state may now amount up altogether to five hundred thousand souls. The rest are merged in the population of the country. There are the *Capufos*, children of negro and Indian women; the *Mamelucos*, or *Curibocos*, children of white men and Indian women; and the *Mulattos*, of white and black parentage. The subdivisions, as the generation succeed each other, are infinite.

² We have already said that all, men, women, and children, wandered about in a state of complete nudity; in some tribes, however, we find earthenware "fig-leaves," or *tangas*, used for covering the sexual parts. These tangas are of very fine clay, baked in the fire. The concave side retains its natural color, but the convex is enamelled with white clay, and on some of them a face is represented. Hartt, "Archives of the National Museum of Rio de Janeiro," vol. I.

³ The Galibis, who are met with in French Guiana, sprung from a source probably allied to the Tupis, and which, according to Martius, gave birth, by a cross with the original people of the Antilles, to the redoubtable race of the Caribs. D'Orbigny: "L'Homme Américain," vol. II., p. 268. M. Girard de Rialle has made the Galibis very well known by his account of several natives of the country who were to be seen in the Jardin d'Acclimatation. (*Nature*, Aug. 19, 1882).

⁴ "Bull. Soc. Anth.," 1881, p. 564.

foundly modified by prior or later intermixtures. Some people present a very marked Asiatic type; their figure is squat and thick-set; their faces are flat, the nose is low, the cheek-bones are prominent; the eyes are of oblique shape, the skin is yellow, the beard thin, and the hair black, long and smooth. We meet with these same characteristics at the present day amongst the Aimores,¹ to whom the Portuguese have given the name of *Botocudos*,² on account of the large round piece of wood (*botoque*) or labret which they are in the habit of introducing into an artificial aperture in the lower lip (fig. 204.)



FIG. 204.—Botocudo.

These people were broken up into innumerable tribes, who, notwithstanding their common origin, were constantly at war with each other. Side by side with the Tupis, the Portuguese found the Tapuyas and the Tupinambas, who occupied the whole coast, from the island of St. Vincent to that of Maranhão, with others, the enumeration of whom would be of no interest. Were these the most ancient people of Brazil? Those, for instance, whose bones have been

found in the caves of the province of Minas-Geraës? We are justified in doubting it, and although the type of the men of Lagoa-Santa was still met with at the time of the

¹ Olfers, Eschwege, "Journal v. Bresilien," vol. II., p. 194. According to Lacerda and Peixotto ("Arch. of the Nat. Mus. of Rio de Janeiro," vol. I.) it would be the Botocudos that are most nearly allied to the primitive race of Brazil.

² Rey describes the skull of the Botocudos as characterized by the prominence of the glabella and of the supraciliary ridges, by the depression of the root of the nose, the absence of frontal eminences, the simplicity of the sutures, the spherical form of the occipital, and by the cymbicephalic shape of the cranial cavity. The cephalic index varies between 71.67, and 74.86. Bordier, "Bull. Soc. Anth.," 1881, p. 566.

European invasion,¹ Quatrefages believes that the barbarous Guaranis had either as predecessors or contemporaries a more civilized race. If we admit this latter hypothesis, it would be to this unknown race that we must attribute the few megaliths, and the rock-paintings and engravings so frequently met with in Brazil.

Herkman, sent into the interior of the province of Pernambuco by the prince of Nassau-Siegen, during the Dutch domination, mentioned two perfectly round stones, the larger six feet in diameter, placed one upon the other.² This is one of those structures which characterize the infancy of culture in all societies. It has been taken for an altar, on account of the accumulation of stones about it, which, in accordance with an almost universal custom, bear witness to the veneration of the natives. In several places in the interior of the country explorers have met with tumuli, sometimes of stones, sometimes of earth. In all, excavations have yielded bones, and with the bones weapons, ornaments of chert or hard rock, crystals, pieces of coral and jute³ root.

The solitudes of Para and Piauhy contain intaglio sculptures, the work of vanished races. These represent animals, birds, and men in the most varied attitudes; some of whom have the body tattooed, and others are crowned with feathers; whilst arabesques and scrolls complete the picture.⁴

Philippe Rey mentions, at the Sierra da Onca, on the rocks overlooking the right bank of the Rio Doce, the occurrence of drawings in red ochre, sometimes singly and sometimes grouped without apparent order (fig. 205). Is this an inscription, and must we attribute to these drawings any meaning beyond the caprice of the artist? We should not venture to say; for all interpretation appears to be impos-

¹ De Quatrefages, *Cong. Anth. de Moscou*, 1877.

² F. Denis, "Le Brésil," p. 252.

³ *Hymenaea curbarii*. C. Rath, "Revista do Instituto historico, geographico, ethnographico do Brazil," 1871.

⁴ Debret, "Voy. pitt. et hist. au Brésil depuis 1816 jusqu'en 1831." Paris, 1879.

sible.¹ In the province of Ceara are rocks, reminding us, by the engravings with which they are covered, of those in Scandinavia (fig. 206). A. de Saint-Hilaire mentions similar ones on the rocks of Tijuco; Koster speaks of a boat sculptured in intaglio,² and every thing justifies us in hoping for new discoveries as travellers are able to penetrate

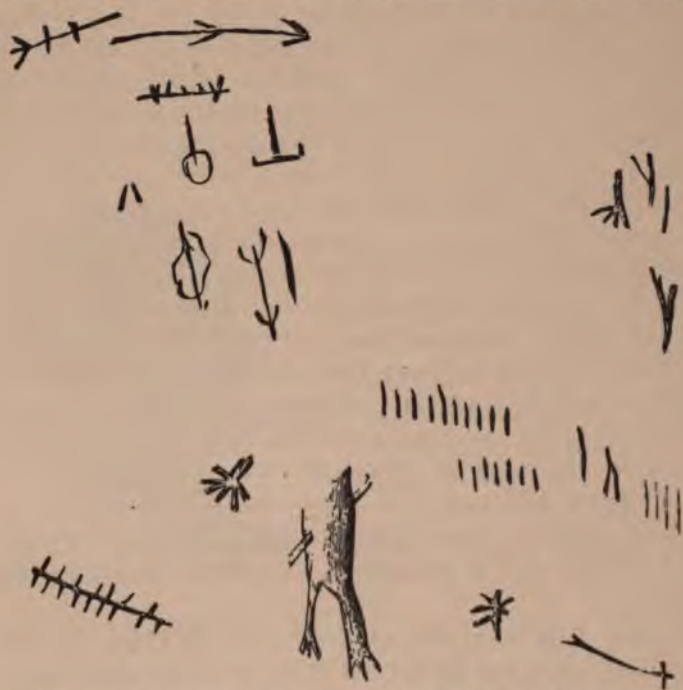


FIG. 205.—Engravings on rock on the right bank of the Rio Doce.

more freely into the virgin forests, savannahs, and deserts, making up a great part of the Brazilian territory.

On the north, the zone of the so-called Piedras Pintadas, stretches into the Guianas, from the Paracaima mountains to Uruana. These drawings, according to Humboldt, date from different periods and are the work of very different people.

¹ "Bull. Soc. Anth.," 1879, p. 732.

² "Voyage dans la partie septentrionale du Brésil depuis 1809 jusqu'en 1815."

But who were these people? The illustrious German traveller adds nothing to make them known to us. These Piedras Pintadas are met with in the south as in the north, in Chili and in Peru, as well as in Arizona and New Mexico, presenting every where a remarkable analogy with each other. This constant resemblance, not met with to a similar degree among any other peoples of the globe, is a racial characteristic, difficult to disregard. Ameghino reproduces a great many inscriptions, which he discovered within the bounds of the Argentine Republic, and which may be compared with those of Brazil¹; they appear to be more complicated, as may be seen by that of which we give a drawing (fig. 207); their art is of a somewhat more developed character, and they doubtless date from a more recent period.

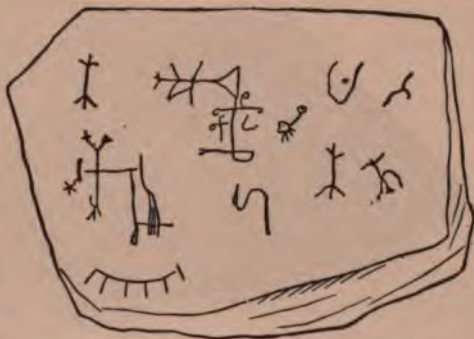


FIG. 206.—Inscription on rock at Ceara.

It is difficult to attribute the drawings of Brazil or of Uruguay to tribes of the Guaraní race, though the case of the African Bushmen might justify us in supposing that savages, even as degraded as these are represented to have been, may have had sufficient intelligence to rudely reproduce on stone the objects which struck their imagination. The same remark, however, will hardly apply to a subterranean passage of considerable length, excavated in very compact sandstone, which excavations have lately brought to light.

On penetrating into *el Palacio*, as this subterranean pas-

¹ "Puro los objetos mas notables, creo son las numerosas inscripciones sobre rocas que han descubierto en diversos puntos de la provincia." "*La Antigüedad del Hombre*," vol. I., p. 541, figs. 353 to 364.

sage is called, we are astonished at the sight of columns placed at regular distances, supporting a regular vaulted roof, and all converging toward a common centre.¹ Excavations, which have thus far been very superficial, have only yielded a few agate arrow-points; now the nearest known deposit of agate is on the banks of the Rio Negro, so that it may probably have been from there that these arrow-points were derived. There is no serious tradition con-



FIG. 207.—Rock covered with engravings. Province of Catamarca.

nected with these structures, so that we will content ourselves with mentioning them, and adding that our ignorance is complete as to their date and origin.

We must say the same for the pottery collected in large quantities in Brazil and La Plata. The most important discoveries of this kind are those made by Professor Hartt² on the island of Pacoval-Marajo and at Taperinha on the Rio Tapajos, one of the tributaries of the Amazon. They en-

¹ Mario Isola, "Caverna conocida por palacio suterreano de Porongos dep. de San Jose." (R. O. del U.) Ameghino, *l. c.*, p. 461. "El Siglo de Montevideo."

² "Report, Peabody Museum," 1873, p. 20.

able us to judge of the general form and ornamentation of this class of objects, the latter consisting chiefly of somewhat complicated lines traced on the soft clay or on that already hardened by the sun. The vases were also sometimes painted, and some cups in the form of birds, of the most brilliant colors, are especially mentioned. The handles present a no less curious variety, imitating sometimes animals, sometimes different parts of the human body, more often still grotesque heads. Imagination was certainly not wanting to these unknown potters. An urn two feet and a half high by four feet in diameter, a clumsy imitation of the human body, is the most remarkable of the objects sent by Hartt to the Peabody Museum. A number of similar urns, called by Hartt *Face Urns*, have also been found, some of them containing human bones. They evidently date from remote times, for nothing that we know of the mode of life of the Tupis, and especially of their funereal rites, justifies us in attributing these urns to them.

Some fragments of pottery have also been found under a kitchen midden near Santarem (province Para); Hartt dates this midden, which consists entirely of fresh-water shells, from the same period as the most ancient heaps in Florida. The broken fragments of pottery were accompanied by bones of various animals; and these bones, enclosed in a compact breccia, might have supplied some useful indications; but, unfortunately, they have not been described, or at least their description has not reached Europe.

Barboso Rodriguez, commissioned by the Brazilian Government to explore the valley of the Amazon, speaks of innumerable fragments of pottery heaped up eighteen miles above the junction of the Rio das Trombettas, also called the Orixamena, with the Amazon.¹ In this expedition he discovered several specimens of a stone image, called *Muirakitan*. It represents a toad or a frog, cut out of hard rock. According to tradition, these were amulets given by the

¹ H. Fischer: "Sur l'origine des pierres dites d'Amazone et sur ce peuple fabuleux," 1880, p. 127.

Amazons to their lovers at their annual meeting on the banks of the Yamunda. Similar imitations of batrachia are met with in Mexico and Peru, and we have spoken of the superstitious idea connected with them by the Chibchas. As for the fable of the Amazons, it dates back to the account of Orillana, one of Pizarro's companions, who went down the river in the years 1539 and 1540, and on his return to Spain told of the battles he had waged with women as warlike as men. These adversaries were probably the Uaupès, slim beardless Indians, with delicate extremities and feminine features, whose wives were only the witnesses of struggles in which they took no direct part.

Lastly, to conclude every thing relating to the pottery of South America, we must mention some urns found in the islands situated to the north of Buenos Ayres, near the mouth of the Parana.¹ These urns are of plastic clay, and the baking to which they were subjected having been very superficial, they fall to pieces as soon as they are disinterred. The fragments vary from an inch to a quarter of an inch in thickness. It has been possible to preserve one, with very great care; this is more than eighteen inches high, by a diameter of nearly twenty-three inches. It is of circular and perfectly regular form; the upper part is rapidly inflected, so as to form a kind of neck two inches high, with a large opening. The vase was painted white, and ornamented with lines, circles, and squares painted red. These decorations vary infinitely, and a great many pieces of pottery bear ornaments in relief, moulded when soft. Each urn contained a seated skeleton, with the head bending over the breast and the knees drawn up toward the chin. All the bones were so much decomposed, by constant inundations of the cemetery, that it was impossible to examine them. In the province of Tucuman similar urns are mentioned, also containing skeletons. In that of La Rioja the bodies were placed in a similar position, but this time in rush-

¹ Burmeister: "*Congrès d'Anthropologie et d'Archéologie préhistoriques*," Brussels, 1872, p. 348.

baskets. The vases or baskets were deposited in natural or artificial caves. Here we have a very characteristic funeral rite.

We have been careful to omit none of the discoveries made. These sculptures, paintings, and pieces of pottery, found at considerable distances from each other, appear to bear witness to a higher culture than that met with by the first Europeans who landed on the eastern coast of South America. In Brazil and Uruguay stone hatchets, weapons, and implements of every kind have frequently been picked up. Lately similar weapons, found in the auriferous deposits of the province of Maranhão, on the north-east coast of Brazil, have been taken to the Anthropological Society of Paris.¹ These are, as Dr. Hamy remarked at the time, analogous to those which come to us from Guiana, Martinique, Guadaloupe, Tahiti, and Upper Peru, thus pleading in favor of the affinity of the Guarani group with the races inhabiting the Antilles. For the present natives, these stones of diverse forms, which they look upon with superstitious terror, have all fallen from the sky. It is interesting to meet in America with a legend which is also prevalent among the nations of the Old World.²

Here closes our archæological task.³ We have given a résumé of the very numerous works of man in the two Americas; we must now study the physical conformation of that man himself, which will be the subject of the following chapter.

¹ "Bull. Soc. Anth.," 1881, p. 206.

² "Les Premiers Hommes et les Temps pré-historiques," vol. I., p. 11.

³ Barbosa Rodriguez has recently found, writes the Emperor of Brazil, to M. de Quatrefages, a hatchet of jadeite; which has been considered to be a remarkable fact, as no deposit of jadeite has been known in America until very lately. Within the last few years, however, jadeite has been discovered in situ both in Alaska and Nicaragua.

CHAPTER IX.

THE MEN OF AMERICA.

IN the preceding chapters is related all that it is at present possible to state definitely about the times which preceded the Spanish invasion in America. We have seen the first inhabitants of the New World passing successively through the phases of a civilization analogous to that of our ancestors; struggling with humble stone weapons against the gigantic animals which have for ever disappeared, piling up huge earthworks to defend their hearths, to honor their gods, or their dead, scaling almost inaccessible rocks to erect their dwellings, founding towns, building monuments, cultivating the arts, establishing governments, and obeying fixed laws. We must now study these men from the point of view of their physical conformation, examine the consequences which result from these studies, and the, as yet very incomplete, conclusions which they justify.

Let us traverse once more the districts where we have noted the relics or mementos of man; let us demand of the sand of the pampas, the mounds of the Mississippi, the huacas of Peru, the huts of the Eskimo, the bones which they conceal. Nothing that touches these questions can be indifferent to the thinker. These men, of whom a few miserable relics are the sole witnesses, have lived, loved, struggled, and suffered like ourselves. Their life has been like the life of our fathers, their past like the past of our own race; their instincts, their aspirations, their ideas, were like the instincts, the aspirations, the ideas, of our predecessors. Unfortunately these bones, the importance of which was once not even suspected, have not always been pre-

served with proper care. The excavations undertaken, either out of curiosity or in search of treasures dear to credulity and avarice, were often not methodically conducted, or superintended by competent men; hence numerous errors, of which it is well to warn the reader at the outset.

Amongst the most ancient human relics discovered on American soil may be ranked a skull brought to light by the works of a railway near Denver, three and a half feet below the surface of the ground.¹ It lay in a loess which does not appear to have been at all displaced; this loess covers immense plains, and offers a striking resemblance to the glacial deposits of Europe. We have already noted in our first chapter that it has yielded numerous implements, of a make very similar to those of European paleolithic times. Every thing points to the conclusion that this skull dates from the same period; but we have no details as to its structure, and if it proves the existence of man on the American continent during the glacial period, it does not tell us what this man was like, who lived in the midst of glaciers.

We have spoken of the very curious discoveries of Ameghino in the La Plata pampas, which discoveries were supplemented and confirmed by others in 1882.² The whole of the country between Buenos Ayres and Rosario along the Parana, is a vast undulating plain, about five thousand square leagues in area.

The pampean formation is beneath a first layer of vegetable earth about three feet deep; it includes an upper layer varying from fifteen to eighty feet, which goes down to the borders of the stream as far as the level of the water, and is characterized by the presence of the *Glyptodon*, *Mylo-*
don, and *Hoplophorus*, with some equine and ruminant animals; also a second layer, from three to ten feet thick,

¹ Ch. Abbott: "The Paleolithic Implements from the Glacial Drift in the Valley of the Delaware near Trenton, New Jersey." "Report, Peabody Museum, 1878," vol. II., p. 257.

² C. Vogt: "Squelette humain associé aux glyptodontes," "Bull. S Anth.," 20th Oct., 1881.

where the bones are less friable and better preserved. It contains the remains of the Mastodon, Megatherium, and Toxodon. Roth, to whom we owe these details, looks upon the two layers as belonging to the quaternary age; but he asserts that in his numerous excavations he has always found the two faunæ completely distinct.

It was in the first layer that the human relics were picked up, near Pontimelo on the north of the province of Buenos Ayres. They included a skull with the lower jaw; the cervical vertebræ were at a distance from the skull; the ribs lay here and there; and one femur adhered to the pelvis. The bones of one hand were in their place; those of the other, with those of the foot, were dispersed; and several were missing.

All the bones were decomposed, and the outer parts were eaten away by decay. They were placed beneath the carapax of a Glyptodon, turned upside down. Under the skull were found an oyster-shell and an implement of deer-horn, on which human workmanship was scarcely apparent.

Such are the facts; we are bound to mention them, in order to omit nothing in relation to the important subject under notice. Unfortunately, we have no information as to the shape of the skull, or that of the long bones. The rapid displacements resulting from rain, wind, and rivulets of water, resulting from the constant storms of the district, prevent us, moreover, from being positively certain of the contemporaneity of the owner of the bones with the Glyptodon.

We have nothing to add to what we have said about the human skeletons met with in the caves, which formed the homes or burial-places of the ancient Americans. Some of these bones probably date from a very remote antiquity, but the observations made are not yet sufficiently numerous to admit of any final conclusion.

We shall make but one exception in favor of the skull of Lagoa Santa (Brazil), and will borrow the description given by M. de Quatrefages at the meeting of the Anthro-

pological Congress held at Moscow in 1879.¹ "This skull," he says, "belonged to an individual more than thirty years old; outside it presents a metallic, bronzed aspect; its weight is considerable. The zygomatic arches are broken in the middle; the styloid processes have disappeared; on the right temple we see an elliptical opening forty-eight millimetres by twenty, probably caused by the blow of some instrument which caused death. The forehead is low and retreating, as in all American skulls; the glabella is prominent; the supra-orbital ridges are very prominent; and the occiput is almost vertical. The external occipital protuberance is wide, smooth, and not prominent; the plane of the foramen magnum carried forward includes a horizontal line joining the two orbits. The cheek-bones are prominent, and project in front. The orbits are quadrangular, and the lateral walls of the skull are vertical. The mastoid processes are small, and almost completely united. On the upper jaw-bone we see fourteen alveoli more or less fractured, and the second molar tooth is worn away."²

We must also remark that the capacity of the cranium (1388 cubic centimetres), although small, is greater than the average of the skulls of the Mound Builders, and that the cephalic index (69.72) is of a pronounced dolichocephalic type.³ The wearing away of the incisors, of which we have already had occasion to speak, attracted the attention of Lund. He looked upon this characteristic as peculiar to the man of Sumidouro, and thought that it ought to separate him from the various human races, except perhaps from the ancient Egyptians, among whom the same peculiarity is met with. To De Quatrefages, on the contrary, this peculiarity,

¹ Besides the account given of this Congress, may be consulted the "*Mémoires de la Soc. d'Hist. et de Géog. du Brésil.*"

² A skull, the general form of which is very much the same, has been found at Rock Bluff, on the borders of Illinois. Schmidt: "*Zur Urgeschichte Nord Amerika,*" *Archiv für Anthropologie*, vol. V., p. 241.

³ Lacerda and Peixotto affirm that the ancient races of Brazil were dolichocephalic. The same peculiarity is of frequent occurrence in the skulls picked up in the plains of the Argentine Republic, and Señor Moreno, in his turn asserts the same to be true with regard to those from the *paraderos* of

noted amongst all the fossil European races, establishes an unexpected relationship between the primitive inhabitants of the Old and the New World. "It is curious," he adds, "to see so striking an artificial characteristic, and which can only result from a common mode of mastication, occurring amongst paleontological peoples and then disappearing entirely amongst the living races of the two continents."

But the danger of too hasty generalization is here exhibited in a striking manner, for this feature is common not only to most crania of the northern Indians of North America, but exhibited almost without exception among the Eskimo and Hyperborean people now living in North America and northeastern Asia.

Quatrefages also affirmed that the shape of the head found in the crania of Lagoa Santa is met with on the shores of both oceans, and as far as the heart of the Peruvian Cordillera. It is also seen in two modern Aymara skulls, and in some heads examined by Wiener. We may reasonably conclude that the race of which the head found by Lund is a type¹ contributed a share, at present undetermined, in the constitution of the Brazilian and Andean-Peruvian races. The present peoples of America, like those of Europe, are the issue of the intermixture of several races. The crossings are true modifications of fundamental types. The men of the primitive races have resisted these modifications; they have not yet completely disappeared, and in spite of variations from one extreme to the other, an attentive study frequently enables us to recognize a predominant type.²

The exploration of the shell-heaps, which are very numerous on the coasts of Oregon and California, have led to interesting results.³ In many places excavations have yielded the mortars and pestles so characteristic of the ancient

¹ Quatrefages attaches importance to the fact that in the Lagoa Santa skull the vertical diameter exceeds the maximum transverse diameter. This double character also recurs among living men.

² De Quatrefages and Hamy: "*Crania Ethnica*," Foster: "*Prehistoric Races of the U. S.*," Chicago, 1873.

³ P. Schumacher "*Report, Peabody Museum*," 1878, vol. II., p. 203.

inhabitants of the country, pieces of pottery, little steatite vases, pipes, daggers, knives, stone arrow-points, carvings of hard stone, and bone or shell implements. In one of these shell-heaps, in the midst of rubbish of all sorts, were picked up thirty skulls, in a pretty good state of preservation, and two or three nearly complete skeletons.

The Island of Santa Catalina contains a steatite quarry, the importance of which is attested by the number of vases, pots, and plates in every stage of fabrication. In the quarry lay fifty skulls, which had belonged to these ancient workmen. Twenty-nine were in a state to be measured; the capacity of one of them was very great, amounting to 1680 c.c.; but this was an isolated case; the average is low, being only 1326 c.c. for the male skulls and 1279 c.c. for the female skulls.

The skulls taken from the shell-heaps of Florida, which latter consist chiefly of fresh-water shells, give a somewhat higher average (1375 c.c.). They are of remarkable thickness, reaching nearly half an inch, and one of these skulls weighs no less than 995 grammes, a weight rarely reached by fossil skulls.¹

Rare as are still the bones, especially the skulls, of the Mound Builders which have been carefully examined, either from the point of view of their structure, or that of the deposit in which they were discovered, we are already able to establish certain general characteristics, such as the small height and capacity of the skull, the obliquity of the zygomatic arch, flattening of the tibia, and perforation of the humerus. These characteristics are met with in most skeletons of the so-called Mound Builders, and they may even help us to distinguish between their bones and those of the more modern Indians, who often appropriate for their own dead the tombs of those who preceded them.

In saying that these are the general characteristics of the more ancient bones found in the mounds, we do not pretend

¹ "Report, Peabody Museum," 1871, p. 13. Foster: "Preh. Races," p. 159.

to deny the existence of numerous exceptions. Nowhere, either in the Old or New World, do we find exactly similar forms, or absolutely typical racial characteristics. Excessive variety is the general law, which still remains unexplained. One of the most ancient skulls which can be attributed to the mound period was discovered in the county of New Madrid, Missouri, under a mound which contained numerous human remains. This skull lay at a depth of about thirty feet and from the mound rose venerable trees, the offspring of a yet more ancient forest, for their roots clasped the old trunks of their predecessors. Since the erection of this mound, the Mississippi had accumulated alluvial deposits to the height of six feet. Near by was picked up, under identical conditions, the tooth of a mastodon. Every thing points to the conclusion that the original owner of this tooth was the contemporary of the man with whom chance had associated him in a common tomb. If a single proof is not enough to justify a belief in the extreme antiquity of this skull, it would seem that the total of the proofs we give will enable us to assert it with something of confidence. We still hesitate, however; for not only is it small and oval, differing little from modern skulls, but Swallow, in giving an account of these facts to the American Association for the Advancement of Science¹ added a description of an excavation under his own supervision in a neighboring mound, which he claims to be of the same period. Several bodies had been deposited in this sepulchre, the bones were decomposed, and only a few little heaps of gray dust remained, last relics of man. On the other hand were picked up numerous fragments of pottery, and vases ornamented with drawings representing heads, busts, sometimes the entire bodies of men and women. These figures are of an elevated type, too little in harmony with the antiquity claimed for the mound.

In other places we come to opposite conclusions. In 1872 Foster² called attention to the resemblance of certain skulls

¹ "Report, Am. Assoc.," Portland, 1873, p. 403.

² "Report, Am. Assoc.," Dubuque, Iowa, 1872.

found near Chicago, at Merom, Indiana, and at Dubuque, Iowa. This resemblance also exists between the weapons, pottery, and ornaments, as well as in the earthworks, and justifies us in deciding on the identity of the population of these regions. The bones present the characteristics we are in the habit of looking upon as belonging to inferior races. Thus the examination of a skull found at Dubuque, that of another of from Dunleith mound, Illinois (fig. 208, *D*), with the study of numerous cranial fragments found at Merom,¹ and at Chicago, show the well-known characteristics of the Neanderthal² skull (fig. 208, *C*), one of the lowest of those which excavations have yielded in Europe.

These are not exceptional facts; the skull found at Stimpson's mound (fig. 208, *B*) reminds us of that of Bor-

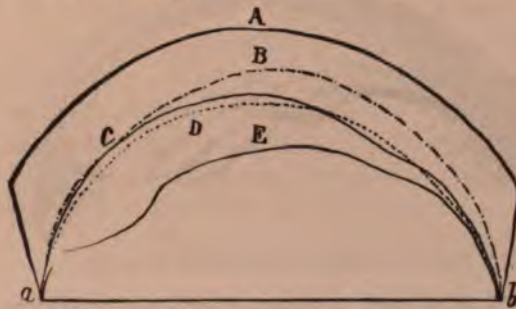


FIG. 208.—*A*, European skull. *B*, Stimpson's mound skull. *C*, The Neanderthal skull. *D*, Dunleith mound skull. *E*, Skull of Chimpanzee.

reby, the degraded type of which is celebrated; those from Kennicott mound are also characterized by a very low forehead. The skull of an infant,³ as far as can be determined, for it is very incomplete, is still stranger, for it resembles, more than any other known skull, those of the anthropoid apes.

¹ It is only fair to add that other skulls, found near Merom, are of a superior type; but they were taken from stone graves, the walls of which are formed of very thin slabs of stone, covered in with flat stones. It is probable that these sepulchres are those of a later period.

² "Les Premiers Hommes et les Temps préhistoriques," vol. I., p. 149.

³ This skull was kept in the collections of the Academy of Sciences at Chicago. It was destroyed in the great fire of 1871.

ancient races of Wisconsin, characteristics subsequently modified either by crossing with a superior race or perhaps by the progress of the primitive race itself.

The prominence of the brows is no less exaggerated in two skulls, one from a mound in the Mississippi Valley,¹ the other from a tumulus in Tennessee.² The teeth of the latter are worn and several of them show traces of decay. The head is in every case depressed on the right side, probably from the pressure of the superincumbent earth after burial.

We have already spoken of the mounds erected in the region of the Great Lakes, and we have said that they were the work of a people that had covered the valleys of the Ohio and Mississippi with earthworks.³ We may mention the great mound of the Red River, in which were found the fragments of a skull in a bad state of preservation, reminding us, in its massive proportions, of that of Neanderthal; and a circular mound near the Detroit River, which latter yielded eleven skeletons, and besides them sepulchral vases, hatchets, arrow-points, scissors, stone drills, pipes, and shell ornaments. The skulls are mostly in bad condition. One from Circular mound has a cranial index of 74.1, one from Western mound of 76.7, and another from Fort Wayne of 77.3. Objects were also obtained made of copper which doubtless came from Lake Superior, a needle several inches long, and a collar made of seeds, threaded on a cord manufactured out of the fibres of bark. Did all these objects form part of the furniture of the tomb? We are justified in doubting it, for the cinders of a hearth were also discovered, and we may presume that the habitation of the living had succeeded the last abode of the dead. This habitation must have been very ancient, for the present inhabitants of the country remember to have seen the mound covered with venerable trees, which have now disappeared.

¹ *American Antiquarian*, July, 1879.

² Jones: "Explorations of Aboriginal Remains of Tennessee," "Smith. Cont.," vol. XXII.

³ Gillman: "The Ancient Men of the Great Lakes," *Am. Ass.*, Detroit, 1875. "Cong. des Am.," Luxembourg, 1877, p. 65.

One of the skulls found in these last excavations and deposited in the Peabody Museum presents important peculiarities. It is singularly low and long, and although adult, for the sagittal suture is united, its capacity scarcely amounts to fifty-six cubic inches, or nine hundred and seventeen cubic centimetres. According to Morton's tables the mean capacity of an Indian skull is eighty-four cubic inches, and the minimum capacity observed by that eminent anthropologist was sixty-nine cubic inches. The difference is decided, and this skull if normal is certainly one of the smallest known. Another peculiarity is no less important :



FIG. 210.—Skull from a mound in Tennessee.



FIG. 211.—Skull from a mound in Missouri.

the distance between the temporal crests on either side of the frontal bone nearly always varies between three and four inches. The minimum known at the present day is two inches, and yet in the Detroit skull it is not more than three fourths of an inch. This is doubtless a very pronounced Simian character, such as is met with in the chimpanzee, for example. Professor Wyman, who carefully examined this skull, asserts that it has not been subjected to any artificial deformation. Here then we have a curious fact ; but it impossible to come to any serious conclusion from a case of such extreme variation, a variation which is

probably individual, for it is not met with in any of the other skulls from the same source.¹

Though most of the skulls which can be attributed with any certainty to the so-called Mound Builders are short or brachycephalic, there are numerous exceptions; and often beneath the same mound have been found skulls which appear to date from the same period, yet which present different forms; numerous excavations have established similar facts in the Old World, which naturally lessens the importance that one is disposed to attribute to mere form.

A few examples will better elucidate the questions. Putnam² mentions two skulls, one brachycephalic and the other dolichocephalic, lying in the same tomb. Of eight skulls from the great Red River mound, three only are brachycephalic. On the other hand, of four found on Chambers' Island, Wisconsin, three are decidedly brachycephalic. Ten skulls have been found under the sepulchral mound at Fort Wayne, of which one is long, or dolichocephalic, while the others are medium, or orthocephalic, or even brachycephalic, with a cephalic index varying from seventy-seven to eighty-two in those that it has been possible to measure. The forehead is retreating, the eyebrows are prominent, and the bone is of average thickness. These characteristics are met with in all the skulls, although in this case the interment appears to date from different periods. In Michigan, the skulls found under the mounds are dolichocephalic, and the tibiae platycnemic.³

Dr. Farquharson⁴ has examined twenty-five skulls obtained from different mounds; the average cephalic index was 75.8, or in other words the form is slightly dolichocephalic. Carr examined sixty-seven skulls from the stone graves of Tennessee, of which nineteen are brachycephalic,

¹ "Report, Peabody Museum," 1873, p. 12. "Report, Am. Assoc.," Buffalo, 1876.

² "Report, Peabody Museum," 1878, vol. II., p. 316.

³ Hubbard: "Am. Ant.," March, 1880.

⁴ "Observations on the Crania from the Stone Graves in Tennessee." "Report, Peabody Museum," vol. II., p. 361.

five only dolichocephalic, eighteen orthocephalic, and fifteen artificially depressed.¹ Jones, after the examination of twenty-one skulls, also found in the stone graves of Tennessee, obtained a somewhat different result. He found no dolichocephalic skull, but five were orthocephalic, eight brachycephalic, and eight artificially deformed (fig. 210).

In Missouri two categories of skulls have been authenticated, differing as much from each other as do those, for instance, of the Caucasian and the Negro races.² The skeletons are in the same position. Vases, weapons, and implements of the same kind have been placed alike near both, and it is difficult to suppose that they do not belong to the same race, or that they do not date from the same period.

Individual variations are considerable. The skull of a child from Atacama is mentioned, in which the cephalic index is only 66; and another, found under a mound of Alabama, in which it reaches 111.8. Except, perhaps, in such extreme cases,³ the same facts can be authenticated in Europe during pre-historic times, and have been perpetuated to our own day. Must we look upon this as the result of a very ancient admixture of races, as examples of atavism, or can it be that the mode of life and differences of the occupation, prolonged during centuries, have exercised such influence? Whatever may be the cause of these modifications, it is certain that they exist, and we must not fail to recognize that, in taking the shape of the skull as characteristic of a race, we obtain results as unsatisfactory in the New as in the Old World.

We are far from accepting the theory of Morton⁴ who constantly proclaimed a unity of physical type amongst all the inhabitants of the two Americas, with the sole exception

¹ "Recent Explorations of Mounds near Davenport, Iowa." "Report, Am. Assoc.," Detroit, 1875.

² Conant: "Footprints of Vanished Races."

³ "In no part of the world," said Retzius, "does cranial morphology present differences more marked or extremes more exaggerated." "Ethnol. Schriften," pp. 37, 98.

⁴ "Crania Americana; or, A Comparative View of the Skulls of Various Aboriginal Nations of North and South America," Philadelphia, 1839.

of the Eskimo.¹ To him the long skulls of the Peruvians do not differ from the round ones of the Indians, except on account of the pressure to which they were subjected during infancy, and the result of which would have been to modify the primitive form. He adds that amongst all those races the same mode of burial was adopted, and that from Canada to Patagonia the dead were placed in a sitting posture. We have already shown how little foundation there is for this latter assertion. The first, though it had been accepted by such savants as Agassiz, Nott, Meigs, and many others, is also now generally abandoned, and important discoveries are every day rendering its further defence impossible.

The form of the skull can have, however, but a very generalized value. We find among the Eskimo such extremes of length as 199 and 165 mm., with respective breadths of 137 and 144 mm., which is sufficient to show that great caution must be used in generalizing from such characters.

This negative conclusion is the only one that can as yet be formulated. The differences of opinion between the most eminent anthropologists add to the intrinsic difficulties which are already so great. Let us take, for example, the Scioto skull discovered under a mound near Chillicothe. This skull, remarkable for its vertical and transverse development, and for the truncated form of the hinder portion, was long looked upon as presenting the most complete type of the Mound crania.² Messrs. De Quatrefages and Hamy,³ in their magnificent work tell us that "the orbits are wide and quadrangular, the nose is prominent, the upper jaws are deep, heavy, massive, and slightly projecting." Dr. Wilson describes the skull as decidedly brachycephalic; according to him the forehead is wide and lofty, and the de-

¹ "Quatrefages and Hamy, in the *"Crania Ethnica,"* place the Eskimo in the Mongolian group because they appear to them, as to Morton, more nearly related to the yellow type than to the American. The Eskimo are generally dolichocephalic.

² Squier and Davis: *"Anc. Mon. of the Mississippi Valley,"* *"Smith. Cont.,"* vol. I., pl. XLVII. and XLVIII.

³ *"Crania Ethnica,"* p. 464.

pression noticed is artificial.¹ Morton gives a different description, and Dr. Foster looks upon the Scioto skull as merely that of a modern Indian. These contradictions illustrate the inconvenience of too absolute theories in the present state of science. An attempt is made to assign all the skulls of one race to a single type, without taking into consideration the vast territory inhabited by that race, or the biological conditions under which it lived.

What would appear to be proved is the relatively small cranial capacity of the Mound skulls, which is also a character found among the various living races of America, especially the Greenland Eskimo. Some measurements will enable us to judge better of this.

Source.	No. of Skulls	Maximum	Minimum.	Average.
		c. c.	c. c.	c. c.
Skulls examined by Farquharson . . .	15	1362	936	1188
Skulls examined by Jones ² . . .	21	1667	1100	1318
Tennessee Stone Graves . . .	30	1825	1084	1341
Kentucky	24	1540	1130	1313
Albany	9	1540	1130	1100
Rock River	11	1540	1130	1205
Henry County	4	1540	1130	1205
Santa-Catalina Id. California	18 Male	1680	1282	1326
	18 Female	1451	1098	1279
Santa-Cruz, California ³ . . .	40 Male	1625	1144	1365
	32 Female	1528	1048	1219

These averages are low, and they appear still lower if we compare them with those obtained from other races. We borrow most of the following table from a very interesting work by Dr. Topinard, published in the *Revue d'Anthropologie*, July, 1882 :

¹ "Preh. Man," vol. II., p. 127. Carr has also published in the reports of the Peabody Museum an excellent article on this question: "Observations on the Crania from the Stone Graves of Tennessee."

² The average for the skulls of men is 1459, for those of women, 1250. Jones, "Smiths. Cont.," vol. XXII.

³ According to Morton, the skulls of the Indian of to-day give on an average 84 cubic inches or 1359 c. c., and not 1376, as stated by Dr. Wyman.

No. of Skulls Examined.	Races.	Capacity.
WHITE RACES.		
25	Solutré ; paleolithic period	1525 c. c.
19	Cave of the Dead Man ; neolithic period	1543 "
44	Baye Cave	1483 "
38	Gallic	1552 "
65	Merovingians of Chelles	1465 "
125	Parisians of the 12th century	1449 "
49	Dutch of Zaandam	1463 "
88	Auvergnats of St. Nectaire	1529 "
63	Bas Bretons	1479 "
57	Basques of St. Jean de Luz	1556 "
60	Basques of Zaraus, Guipuzcoa	1499 "
27	Savoyards	1494 "
11	Croats, Slav. race	1433 "
28	Corsicans of Avapesa, 18th century	1475 "
19	Arabs	1447 "
YELLOW RACES.		
28	Chinese	1486 c. c.
29	Javanese (coll. Vrolik)	1473 "
42	Polynesians	1449 "
11	Laplanders	1585 "
101	Eskimo of Greenland (Hayes)	1250 "
42	Eskimo of N. W. America (Dall)	1401 "
25	Aleutians (Dall)	1409 "
BLACK RACES.		
21	Hottentots	1317 c. c.
21	Nubians	1329 "
21	Australians	1337 "
21	Western Negroes	1423 "
21	New Caledonians	1462 "

We must descend very low in the human scale to find races presenting so small a cranial capacity as the American Indians of the Mound period.

A few exceptional skulls have, however, been found ; one of those from a stone grave of Tennessee measures no less than 1825 c. c.¹ ; it is equal, in consequence, to the skull of Cuvier. Another skull is mentioned, also picked up in a stone grave, which reaches 1667 c. c. Dr. Jones possesses one in his collection of 1688 c. c. ; the Army Medical Museum at Washington another, discovered in Illinois, of 1785 c. c. ; and Schoolcraft speaks of one of 1704 c. c. Compared with the Albany skull, which only measured 936 c. c.,² these dif-

¹ L. Carr : "Obs. on the Crania from the Stone Graves in Tennessee." "Peabody Museum Reports," vol. II., p. 383.

² Wyman mentions a skull of capacity amounting only to 530 c. c., but it is that of a microcephalic person.

ferences are considerable. Skulls of extreme size are a grave argument against the value of averages; it is evident that they vitiate all the results that can be obtained.

If it remain proved that the development of the cranial volume amongst the various races of the New World is inferior to that of other human races, whether ancient or modern, except perhaps those who are accounted the most inferior of the globe, this may be an anatomical characteristic rather than a psychological one, and we must not assume from it that the people were of inferior intelligence. Other causes doubtless influence the intellectual worth; no one would dream of comparing the ancient Peruvians, the most advanced people of South America, with the wandering, savage, and blood-thirsty Indians of North America; yet the average capacity of the skulls of the latter is 1359 c. c., whilst that of the Peruvians is only 1250 c. c. In glancing through the preceding table, it is easy to see that the cranial capacity is not at all in harmony with the value of the race, and if from an individual point of view the skulls of Cuvier and Byron are of large capacity, numbers of remarkable and even of eminent men might be mentioned whose cranial capacity was, on the contrary, very small. The skull of Dante scarcely exceeds the average, whilst three skulls of unknown men, taken from the potter's field of Paris, reach the maximum. The superiority of a people, therefore, does not depend either on cranial capacity or on the characteristics of certain bones. It is evident that other factors enter into the question, of which we are as yet pretty ignorant.

The flattened form of the shin bone or tibia, called platycnemia, is frequently met with among the various American races (figs. 212, 213); it is often more pronounced than in the gorilla or chimpanzee.¹ Wyman looks upon this as a distinctive characteristic, for under certain mounds it is met with in nearly all the tibia discovered, and those in which it

¹ With these two monkeys, the mean relation between the two diameters is 67. Gillman: "Rep. Am. Assoc.," Detroit, 1875, p. 316.

does not occur generally belong to men buried later than the erection of the tumulus. But, although these platycnemic or sabre-blade-like tibiae are common among the big monkeys, it does not follow that we ought to look upon it as characteristic of inferiority. While reserving this point, it is certain that among the bones collected from the mounds of Kentucky, Missouri, Michigan, and Indiana, as also from the Florida shell-heaps, the number of those in which platycnemia occurs may be estimated at thirty per cent. It is no less marked in a certain number of tibiae discovered in the recesses of the celebrated Mammoth Cave.¹

Platycnemia is yet more apparent, and the sharp edge more pronounced, in the tibiae taken from the great mound of the Red River, and in those of Fort Wayne.² The tumuli



FIG. 212.—Section of an ordinary tibia at the level of the nutrient foramen.



FIG. 213.—Section of a platycnemic tibia.

of the St. Clair River, those erected near Lake Huron, with a very ancient one situated on Chambers' Island, Wisconsin, furnish analogous examples.³ Beneath all these mounds, human remains are associated with stone implements, bones of birds and fish, rude pottery and necklaces of teeth or little bones, all objects attesting a poorly developed culture.

On some of these tibiae the relation of the transverse diameter to the antero-posterior is only 0.48; even this is not the extreme limit, for in certain bones from a mound

¹ "Report, Peabody Museum," 1875, p. 49.

² Gillman: "Rep., Am. Assoc.," Buffalo, 1876.

³ "Report, Peabody Museum," 1873. Short: "North Americans of Antiquity," p. 30.

near the Detroit River it is as low—exceptionally so, we must add—as 0.43, and even 0.40. These figures are remarkable, and they will be better understood if we compare them with those given by Broca for the old man of Cro-Magnon; the relation between the two diameters, he tells us, is 0.68, and yet this is one of the extremest cases of platycnemia observed in France.

Platycnemia, as well as the compression of the femora, which is generally considerable, are perhaps the results of the truly immense efforts that the ancient inhabitants of America, being without domestic animals, were condemned to make. They had to follow game on foot, and overtake it by speed; they had to carry heavy loads across mountains and marshes; so that it need not cause much wonder if their physical conformation was affected by such a mode of life. Some anatomists look upon these anomalies as the result of greater liberty in the movement of the foot and a more constant habit of prehension. Perhaps we ought also to take into account the kind of food eaten by these populations, which in course of time might modify the bony parts. It is, however, certainly an indication of a low type of physical structure.

We have said that the flattening of the tibia was much more rare in Europe than in America. It is easy, however, to give examples of it on the former continent; Busk¹ was one of the first to notice it in bones from Gibraltar; Carter Blake,² in others found in Wiltshire, which date from neolithic times; Dr. Prunieres,³ in numerous skeletons from the department of Lozère, also dating from the same period; Baron von Duben,⁴ on those from Scandinavia; Bertrand,⁵ on a tibia found at Clichy; Broca,⁶ on another from Sainte-

¹ "Bull. Soc. Anth.," 1869, p. 148.

² "Journal of the Anth. Soc. of London," 1865, p. 146.

³ "Bull. Soc. Anth.," 1878, p. 214.

⁴ "The tibia is always compressed, resembling a sabre" ("Cong. préh. de Copenhague," 1869, p. 243). "Mat.," 1869, p. 544.

⁵ "Bull. Soc. Anth.," February, 1869.

⁶ "Bull. Soc. Anth.," 1866, p. 642.

Suzanne (Sarthe). Side by side with these specimens the tibiæ found by Dupont in the caves of Belgium,¹ with a great number of others dating, to all appearance, from paleolithic times, are triangular, resembling those of modern Europeans. The characteristics, then, which have been proposed in order to differentiate races have existed from the most remote antiquity, and among the most varied peoples; this is without doubt an important fact.

The perforation of the humerus has also been considered a racial characteristic by Dr. Topinard, although we are unable to say what race or races, if any, bequeathed this peculiarity to their descendants. It is very frequently noticed in bones from the mounds, and often occurs upon half of those picked up. Going toward the south this proportion diminishes, until it is no more than thirty-one per cent. The Peabody Museum contains no less than eighty humeri found beneath the mounds of the west, or under those of Florida, of which twenty-five are perforated; it also contains fifty-two humeri belonging to white races, in only two of which this typical characteristic occurs.² Side by side with these facts, of ten skeletons found at Fort Wayne but one has perforation of the olecranon fossa.

It is difficult, then, to establish a general law; it has been said that this perforation³ is a characteristic of physical inferiority, which assertion is founded on the fact that it is of more frequent occurrence among the anthropoid apes⁴ than among men, among negroes⁵ or Indians than among whites;

¹ Hamy tells us, however, that a tibia from the Goyet cave is platycnemic. "Bull. Soc. Anth.," 1873, p. 427.

² "Report, Peabody Museum," 1872, p. 28. "Cong. des Am.," Luxembourg, 1877, vol. I., p. 69.

³ Which may have been the result of the length of the bone hindering the play of the articulation.

⁴ Wyman has authenticated the perforation of the olecranon fossa on but one of the humeri of the two male gorillas that he was able to examine. He did not find it on a female chimpanzee, nor on a male ourang-outang, both belonging to the British Museum; the Anthropological Society of Paris owns a fine gorilla skeleton, which has one of the humeri perforated.

⁵ Of fourteen negro humeri preserved in the Jardin des Plantes perforated.

that its tendency is to diminish among the European races, and that it is more often met with in bones from ancient cemeteries than amongst our contemporaries.¹ This conclusion appears to us still somewhat premature, in the present state of anthropology.

It has also been said that the people of the Mound period had very long arms; this again is called a simian characteristic. Gillman has, in fact, recently shown that there is nothing in it, at least with regard to the men buried under the mound of Fort Wayne, and that estimating the average stature at 1,000 we have the length of the arm as follows:

In modern Indians	353
Whites	348
Mound skeletons	343

The arms of the last-named, therefore, far from being longer, were shorter than those of some modern Indians, or white men. But it is probable that the material is still too scanty for any positive conclusions.

The Mound people appear to have varied as much in stature as our modern races. A skeleton is mentioned, found in a stone grave of Tennessee, which measured more than seven feet¹; another, discovered at Fort Wayne, only reached five feet eleven inches. Two skeletons, one from Utah, the other from Michigan,² exceeded six feet. The latter, enclosed in a regular winding-sheet of clay, was remarkable for its retreating forehead and prominence of its brows. Beside it lay hewn stones and fragments of pottery, ornamented with human figures. These are probably very exceptional cases; Professor Putnam, who has excavated with extreme care numerous sepulchres in Tennessee, is convinced that the men who rested there were of ordinary

¹ We may remark that amongst prehistoric French races the perforated humerus has been thought to belong to another race than that which shows the platynecmic tibia and the femur with the sharp edge. "Rev. d'Anth.," 1878, p. 514.

² Jones: "Explorations of the Aboriginal Remains in Tennessee," "Smith. Cont.," vol. XXII.

³ *Am. Antiquarian*, July, 1879.

stature, and although he often met with tombs made of slabs measuring from seven to eight feet long, he always noticed a pretty wide space between the head or the feet of the dead and the walls of the tomb.¹ We may add that all the skeletons found in the numerous stone cists of Madison county, Illinois, were of small stature, and that the bones were remarkably slender.²

We have already described the numerous cañons met with in New Mexico, Colorado, or Arizona, and the ruins which rise wherever the rock has provided space, however limited that space may be. We possess few bones of these indefatigable builders, which is easily explained by the difficulties attending excavations in a country still uninhabited, and where explorers are constantly exposed to danger from the Apaches.

One skull is, however, mentioned from the Chaco Cañon, New Mexico. Among the ancient alluvial deposits bearing witness to arroyos now dried up, fragments of walls and foundations testify to the presence of a formerly numerous population, anterior perhaps to the arrival of the Cliff Dwellers. It was in the midst of these deposits, at a depth of about fourteen feet, on a heap of broken pottery, that this skull (fig. 214) was found. Probably it had been brought down by water, for researches have not resulted in the discovery of any other human bones.³ From what period must we date it? With what race must we connect it? It is at present impossible to decide; we only know that it belonged to a young woman, whose last molar teeth had not yet appeared.

It is asymmetrical, the forehead is low, the orbits are oval and slightly prominent. The most curious characteristic is the flatness of the back part of the head. This flatness is no less marked in the parietal bones, and especially in the

¹"Report, Peabody Museum," vol. II., p. 306.

²Bandelier: "Report, Am. Assoc.," St. Louis, 1876. Aehler: "Stone Cist near Highland, Madison county, Illinois,"

³Dr. W. Hoffman: "Report on the Chaco Cranium"; U. S. Geol. and Geog. Survey, Washington, 1878.

left parietal. The skull was so completely filled with agglutinated sand that it had to be broken to get the exact measurements, so that its capacity has remained undetermined.

To Dr. Bessels' we owe a complete description of several skulls recently discovered, which may be attributed either to the Cliff Dwellers or to the inhabitants of the pueblos.



FIG. 214.—Skull found in the Chaco Cañon, and attributed to the Cliff Dweller.

Two of them came from an ancient burial-place near Abiquico, (New Mexico). Each tomb was surrounded by piles of stones, forming now a rectangle, now a circle, and near to each body care had been taken to place numerous fragments of pottery. The first of these skulls presents a very marked flattening of the left parietal, and a less apparent flattening of the right parietal. The orbits are prominent, the forehead is not distinguished by any special characteristic, the lower jaws are massive, and the teeth, especially the incisors, slightly worn. The capacity is 1325 c.c. The second skull is that of a woman of about seventeen years old; the last molar teeth are beginning to appear, the prognathous character is very much marked. The same flattening

¹ "The human remains found among the ancient ruins of S. W. Colorado and New Mexico," p. 47.

is noticed as on the skull just described, only in that of the man it is more pronounced on the left side, and in that of the woman on the right. The capacity of the latter is very small, and does not exceed 1020 c.c.

A short time afterward Dr. Bessels assisted at the reception for the museum of the Smithsonian Institution of numerous objects collected from the mounds of Tennessee.¹ Amongst these objects were two skulls (figs. 210, 211) which struck him by their resemblance to those of New Mexico. This resemblance is such, he tells us, that it is impossible to distinguish them from each other.

We will not dwell upon the other skulls of the Cliff Dwellers; to do so would be little more than a monotonous repetition. In all we note this characteristic depression, now more marked on the right, now on the left; it is certainly artificial, and we find it already very marked in the skull of a child of ten years old, whose jaw also shows a sensible tendency to prognathism.² In the skull of a young woman occurs a deformation similar to that of the Peruvians. The orbits are but little prominent, the forehead is retreating, and the teeth are very irregularly set.

De Quatrefages and Hamy, in discussing these discoveries, add that there can be no doubt as to the ethnic identity of the Mound Builders and Cliff Dwellers; which conclusion would extend to the builders of the Casas-Grandes of the Rio Gila, if all presented the same characteristics as the subject exhumed by Pinart, from a tumulus near the Casa-Grande of Montezuma.³

The top alone of this skull, which now belongs to the Paris museum, is preserved. Its cranial index is 90.36. One of the skulls sent from Teul presents the same cephalic peculiarities, except that it is more flattened from before backward, and that the index exceeds 97.

But although the ethnic characteristics of the Mound

¹ "Congrès des Américanistes," Luxembourg, 1877, vol. I., p. 147.

² This head is preserved in the Osteological Collection of the U. S. Army. Its capacity is 1213 c.c.

³ "Crania Ethnica," p. 464.

crania are met with even in distant regions, the type is no longer general, according to the learned authors of the *Crania Ethnica*, in the countries they peopled, and they assert that among the number of skulls of modern Indians preserved in various collections, we find but a few resembling those of which we have just spoken. What most clearly would result from these facts, were they well authenticated, is the rapidity with which anatomical modifications of a secondary order might proceed; hence their small importance in fixing with any certainty the characteristics of a race, and above all for following successfully the development of these characteristics through generations.

The analogies between the Mound crania and those of the ancient inhabitants of Anahuac are no less striking than those between the former and the Cliff Dwellers.¹ Four skulls from the tombs of Mexico, Otumba, and Tacuba, reproduce the type of the inhabitants of North America; others found at Santiago-Tlatelolcoli admit of still less doubt.² In all we see the flattening of the occiput, the retreating forehead, and massive bones, so common among the Mound crania, especially amongst those from the banks of the Ohio and Mississippi.

Amongst the Mayas this flatness, doubtless due to artificial pressure, is still more apparent. This is proved by the bas-reliefs of Palenque (figs. 123, 124). The pointed heads, the retreating foreheads presenting so strange an appearance, evidently bear witness to the type most admired among them. Recent explorers think they have found this type amongst the inferior tribes who dwell in the mountains; but it has disappeared, or never existed, among the people who erected the monuments of Yucatan and Honduras. The sculptures of Chichen-Itza present a type absolutely different from the preceding (fig. 135). "The skull is large," says Charnay, "flattened at the top,"³ though the forehead does

¹ Morton: "*Crania Americana*," pl. XIX., XXXI. Quatrefages and Hamy: "*Crania Ethnica*," p. 466.

² These skulls belong to the Paris museum.

³ "*Cités et Ruines Américaines*," p. 341.

not bulge out, but forms with the aquiline nose an almost straight line."

The artificial deformation of skulls amongst the Peruvians renders their study very difficult; this deformation is the result of mechanical pressure on the skulls of new-born infants; the direction, amount, and duration of this pressure, all alike differing according to circumstances. Gosse, in his dissertations on the races of Peru, says that three kinds of deformation were practised: the occipital, amongst the Chinchas, and, perhaps, in the family of the Incas; the elongated symmetrical deformation, amongst the Aymaras; while the cuneiform obtained in several provinces, such as that of Chiquito. This last gave to the head a long slope from the front to the back. These deformations were still practised in 1545, and at that time the council of Lima solemnly forbade them under the names of *Caito*, *Opalta*, and *Oma*. In five hundred skulls from Peru, the property of the Paris museum, scarcely sixty are exempt from this deformation.¹ It occurs sometimes from the front toward the back, as is the case in nearly all the skulls taken from the huacas of Ancon,² while sometimes it is circular, giving to the head a conical form. This was the custom, the fashion if we like to call it so, sought after by the Peruvians who inhabited the neighborhood of Lake Titicaca; this characteristic occurring in nearly all the skulls from the Chulpas.³

As we have already had occasion to remark the cranial capacity was very small. In eleven skulls from Ancon, which showed no trace of deformation, the average in only 1129 c. c., the maximum is but 1260 c. c., and the minimum sinks to 1040 c. c.

In other parts of Peru, as can be seen by the table we give, the results obtained are no higher, and at Chimú the average sinks even lower.⁴

¹ De Quatrefages and Hamy: "Crania Ethnica," p. 474.

² "Report, Peabody Museum," 1874, p. 8.

³ "Report, Peabody Museum," 1876, p. 10.

⁴ Squier: "Incidents of Travel and Exploration in the Land of the Incas," 2d edition, London, 1878, p. 582.

Source.	No. of Skulls.	Maximum	Minimum.	Average.
		c. c.	c. c.	c. c.
Chulpas near Lake Titicaca	6	1445	1155	1292
Casma	14	1455	1050	1254
Amacavilca	16	1320	1055	1176
Chimu	7	1460	1065	1090
Pachacamac	4	1365	1035	1195
Cajamarquilla	5	1410	1155	1268
Truxillo	4	1325	1135	1286
Total	56	1460	1035	1212

Morton and Meigs give as the average capacity of Peruvian skulls measured by them 1230 c. c.; we have above tabulated it at 1212 c. c. These averages, which do not differ sensibly from those of Squier, are very low, and do not occur again among any known race. The Peruvian maxima scarcely equal the minima of other people. This is a fact, of which we have no satisfactory explanation.

Rivero and Tschudi¹ recognize three different races in Peru: the Chinchas, occupying the Pacific coast from 10° to 14° S. Lat.²; the Aymaras, established on the lofty tablelands of Bolivia; and lastly the Huancas, so named after the most powerful tribe amongst them, who lived between the Cordillera and the Andes from 9° to 14° S. Lat. The authors of the *Antigüedades Peruanas* do not admit artificial deformation except amongst the Chinchas, and pretend that amongst the other races it is congenital, and that it exists amongst children who have not been subjected to any kind of pressure, and even amongst certain fetuses. This isolated fact would not be a proof, for deformations made on the body at the time of the birth, as Gosse observes, may to a certain extent be transmitted hereditarily. They become permanent when both sexes have been subjected to the same deformations to a similar extent, during many succes-

¹ "Antigüedades Peruanas."

² The Chimus, of whom we have spoken in a previous chapter, should be classed amongst the Chinchas. Meyer ("Reise um die Erde; Beiträge zur Zoölogie," Bonn, 1834) speaks of them as the primitive inhabitants of Peru.

sive generations, on condition that the means employed have profoundly modified alike nutrition and the structure of the bones.¹

To the difficulties resulting from deformation which was practised by different processes throughout the land of the Incas, we have to add, as everywhere else, the incessant mixtures of race and type which are met with amongst the dead. At the Castillo of the great Chimú, Squier saw together regularly-shaped heads, attributed to the Qquich-uas, square-shaped skulls, obtained by posterior pressure, and elongated skulls (fig. 215), the cephalic characteristics of which resemble those of Palenque and Copan, as they are made known to us by sculptures.



FIG. 215.—Deformed skull, said to be Aymara, from the "*Crania Ethnica*."

Dr. Wilson² admits only two distinct types. The Peruvians of the time of the Incas were brachycephalic and of small stature; they had a retreating but very lofty forehead and a flattened occiput; their bones were light and delicate, their fingers long and tapering. These men must have formed an aristocratic class, incapable of fatiguing work. The more ancient Peruvians were on the contrary dolichocephalic; their bones are heavy and massive, the attachments robust; every thing with them indicates great muscular force. Morton confounds these two types, and is of opinion that the second sprung from the first, and was obtained by the artificial compression to which infants were subjected.³ But

¹ Gosse, *l. c.*, p. 162, says that the fact appears to be corroborated by modern experiments on domestic animals.

² "Prehistoric Man," vol. II., chap. XX., pp. 145, 158, 165.

³ Nott and Gliddon, "Types of Mankind."

Wilson¹ justly replies to him that skulls artificially deformed are always asymmetrical, and that the dolichocephalic skulls on the contrary, which are looked upon as normal, are always completely regular. They have also peculiar characteristics: they are, for instance, longer and narrower; the upper jaw is extremely prominent; and the teeth, especially the incisors, are oblique.

We do not contest any of these assertions; we content ourselves with repeating what we have already said several times, that the existence of different types would not necessarily imply that of different races; the causes of the origin or of the modifications of types being as yet absolutely unknown.²

The custom of mummifying human bodies has enabled us to make many useful observations. The mummy discovered at Chacota, for instance, an illustration of which we reproduce (fig. 179), gives as the length of the humerus nine inches, that of the hand five and one half inches, that of the middle finger three and one half inches, that of the femur thirteen inches, of the tibia twelve inches, of the foot seven and a half inches; whilst the width of the hand is only two inches, and of the foot two and one half inches.³

In accordance with custom, locks of hair were placed by friends in the tomb as a last testimony of affection. This hair is as fine as that of the Anglo-Saxon races, and the faded color generally varies from dark brown to chestnut. It was probably originally black. It was the custom to wear

¹ "Few who have had extensive opportunities of minutely examining and comparing normal and artificially deformed crania will, I think, be prepared to dispute the fact that the latter are rarely, if ever, symmetrical." Wilson, *l. c.*

² Virchow notes the frequent occurrence in Peruvian skulls of an anomaly, known under the name of the *Inca bone*, or the *interparietal bone*, and asserts its recurrence amongst the Indo-Chinese and the Malays of the Philippine Isles. According to him, then, it would be characteristic of these races; but Anoultchine, in a recent work ("Rev. d'Anthr.," 1881), has shown that it is also met with amongst the negroes. It is doubtless common to individuals among all the less developed races. See Gosse, *l. c.*, p. 165, etc.

³ J. Blake: "Notes on a Collection from the Ancient Cemetery of the Bay of Chocota," "Report, Peabody Museum," 1878, p. 284.

the hair long, to plait it, and let the plaits hang down behind the head. Women added false hair to their plaits, and after the lapse of centuries the opening of the tomb has betrayed their vanity. It is only just to add that it was not only the woman who thus called art to the aid of nature. The dried head of a man of advanced age, for his hair is dashed with gray (fig. 216), is covered with little false plaits arranged on the forehead. This head, which comes from an ancient Peruvian cemetery, presents notable differences from others recently discovered. The forehead is lofty, the nose prominent, the cheek-bones are high, the incisors are set vertically, and the ears are disproportionately distended. The hair is now brown, and the plaits hang in tresses, as did those of the French hussars of the end of last century.¹

If we advance further southward, we shall meet with distinctly dolichocephalic races, resembling probably the ancient races among whom this form has been noticed. The man discovered by Ameghino in the pampas was of small stature, and his skull was dolichocephalic. It was the same with those found by Moreno in the paraderos of Patagonia; both recall the type of the Greenland Eskimo of the present time.

The fossil skull of Lagoa Santa was also dolichocephalic, and the learned authors of the "*Crania Ethnica*" mention several other similar skulls discovered in Brazil. The cephalic index of one of them, which was in a condition for measurement, is 70.

The Botocudos, who are very distinct from the tribes surrounding them, and who doubtless represent the most ancient races of the country, are also dolicocephalic.

They are no less remarkable for the height of the skull, the prominence of the brows, and the lowness and rectangular form of the orbits. In all these respects they present, as do the Patagonians, numerous analogies with the Eskimo.²

¹ Blake, *l. c.*, p. 301. Morton: "*Crania Americana*," pl. I.

² "La raza esquimal diffiere de la masa de la poblacion americana, y conserva una tal homogeneidad que presenta el aspecto de una raza primitiva apen-"

who inhabit the other extremity of the American continent. May we not suppose that both were dispersed and then retreated, little by little, before conquering races, to whom they could offer but an inefficacious resistance? This was what happened in Europe at the time of the invasion of various Asiatic races; the Basques and Finns were driven to the extreme limits of Europe to arid and uncultivated regions; and although it is impossible to establish with any

degree of certainty, we are justified in supposing that similar events may have taken place in America, and that these ancient races, driven from the regions they first inhabited, were the contemporaries of the European paleolithic people. Every thing points to the conclusion that the most ancient inhabitants of America were little inferior in antiquity to the earlier inhabitants of the Old World.



FIG. 216.—Head of a mummy from an ancient Peruvian sepulchre.

The Spaniards brought small-pox with them, which caused great havoc amongst the natives, whole tribes having been

modificada, por unos que otros cruzamientos. Lo que sobre todo distingue al esquimal de todos los demás pueblos de la tierra es su cabeza sumamente larga,"—Ameghino: "La Antigüedad del Hombre en el Plata," vol. I., p. 163. "The Eskimo and the Botocudos are short, the cephalic index (73) is the same; both have prominent cheeks; small, oblique eyes; coarse, straight, black hair; large, distended ears; a flat, round face; and a tendency to obesity. Even the *botoque*, the strange ornament to which the Botocudos owe their name, is met with among the western Eskimo." Bordier, Topinard: "Bull. Soc. Anthr.," 1881.

destroyed by the scourge. They in their turn are supposed by some to have received from the Americans a no less cruel malady, syphilitic affections destined to blight, if not to destroy, the very source of life.¹ This last assertion has been hotly contested; it is alleged that syphilis existed in America before the 16th century; did it also exist in Europe? This is a point which has remained very obscure. The Chinese historians relate that, 2637 B. C., the Emperor Hoang-ty described syphilitic affections in both sexes. But this fact, which would prove the existence of syphilis before the discovery of America, is very much disputed. Great stress has been laid on the Spanish word *Buba*, which is translated by syphilitic affection; but it remains to be ascertained whether this word then had the same signification which we give to it now.² One thing which is not doubtful is that the bones bearing the supposed marks of this malady have been found in the stone graves of Tennessee,³ and that traces of a similar kind occurred on other bones⁴ from the mounds of Iowa, Rock River, Illinois, and those near Nashville.⁵ It is not only in the Central United States that we see these indelible traces, and we have already mentioned a skull, from the paraderos of Patagonia, on which Broca noticed traces of inflammatory action which he did not hesitate to attribute to a syphilitic affection.

If this diagnosis be correct, however, it may be taken as bearing either way; that is, the interment may have been subsequent to the invasion of the whites or the disease preceded their establishment in America.

¹ Clavigero: "Storia Antica del Messico," vol. I., p. 117; vol. IV., p. 303. Herrera: "Hist. Gen.," dec. II., book CXXXI. Gomera: "Conq. Mex.," fo. 148. Sahagun: "Hist. Gen. de las Cosas de Nueva España," vol. II., book VII., p. 246. Oviedo: "Hist. de las Indias."

² Troisième, "Cong. des Américanistes," Madrid, 1881

³ "Several skeletons in these mounds bore unmistakable marks of the ravages of syphilis," Jones: "Aboriginal Remains of Tennessee," "Smith. Cont.," vol. XXII.

⁴ Farquharson: "Proc. Am. Assoc.," Detroit (Michigan), 1875.

⁵ Putnam: "Arch. Expl. in Tennessee," "Report, Peabody Museum," vol. II., p. 305.

It is questionable whether these lesions are due to the alleged pathological cause; "Several pathologists who have examined these bones unite in stating that they do not prove the existence of syphilis, as other diseases not syphilis might have such effects"¹; but other facts tend to confirm the hypothesis. Accounts which have come down to us lead us to believe that the Mayas were acquainted with venereal affections, and that to cure them they used the bark of a tree called *Guayacan*, native to Nicaragua.² It is alleged that in the ancient languages of America there are words relating to these maladies, the origin of which the natives, by a grotesque fancy, ascribed to one of their gods, Nanhuatl, who is said to have been the first to infect the human race with this disease.³ At all events, there is no *a priori* reason why such a disease may not have been common to the whole human race from a very early period. Other diseases of the bones, though of less frequent occurrence, were not unknown. Dr. Farquharson describes a curious affection of the cervical vertebræ, which appears to have been cured. Recovery from this lesion was rare and very tedious, requiring a long time and constant care. These people then lived in societies, and did not abandon those belonging to them who were afflicted by sore infirmities. Several skulls of Tennessee bear traces of ancient inflammations⁴; old anchyloses have also been noted on long bones. Dall collected at a pre-historic village site in the Aleutian Islands, a skeleton of which the entire vertebral column was anchylosed as a sequel to some severe affection; so that the individual must have lived for years in a crouching posture. This skeleton is now in the Army Medical Museum at Washington.

Neither were hurts resulting from traumatic causes rare.

¹ Putnam: "Rep., Peabody Museum," vol. II., p. 316.

² Dr. Bruhl (*Cincinnati Lancet and Clinic*, May 29, 1880) speaks of the syphilitic remedies, known to the inhabitants of Central America and Peru.

³ Brasseur: "Hist. des Nations civilisées," vol. I., p. 181.

⁴ L. Carr: "Observations on the Crania from the Stone Graves of Tennessee;" "Peabody Museum Report," vol. II., p. 381.

The Peabody Museum contains two Peruvian skulls collected by Agassiz, which deserve to be mentioned. One of them has a fracture five centimetres long by three broad and eighty-four millimetres deep. The work of repair is very visible, and four fragments of the bony structure have again become united. The other skull, which belonged to an adult, has a long fracture on the forehead, eleven centimetres long by five broad, which was doubtless produced by a violent blow from a club. Here, too, the five or six fragments that can still be made out had united. In both cases the wounded had probably lived for many years after their injury; they had triumphed by the strength of their constitution, for there are no traces of any surgical operation, such as the removal of pieces of bone.¹

It was not always thus. On another skull, also belonging to the remarkable collection of the Peabody Museum, a perforation can be seen, probably attempted as a mode of healing an inflammation of the cranium, the trace of which is very apparent, and Squier speaks² of a Peruvian skull (fig. 217), found in a cemetery of the Yucay valley, in which a piece seems to have been taken out by means of four regular incisions. The opening measures one hundred and seventy-seven by one hundred and forty-six millimetres. Here, too, the bones show traces of an ancient inflammation, and some eminent surgeons, such as Nélaton and Broca, have not hesitated to attribute this perforation to an operation attempted during life.

We must not confound these operations with the posthumous trepannings³ of frequent occurrence in some parts of America.

We know nothing certain about the reason for these trepannings; whether they were a mark of honor, a religious

¹ Wyman: "Report, Peabody Museum," 1874, p. 10.

² Squier: "Incidents of Travel and Exploration in the Land of the Incas," p. 457, appendix A.

³ Am. Assoc., Detroit, 1875. H. Gillman: "Add. Facts Concerning Artificial Perforation of the Cranium in Ancient Mounds in Michigan," Am. Assoc., Nashville, 1887.

rite, or were made to let out the brain, or for hanging up the head, or were intended to allow the soul to revisit the body that it had inhabited. All these hypotheses are possible; none of them can be proved. Excavations in a mound of an irregular conical form, from ten to fifteen feet high, have brought to light five skeletons buried standing; a sixth lay in the centre of the tumulus, evidently occupying the place of honor; all alike had a similar perforation in the skull.



FIG. 217.—Trepanned Peruvian skull.

Trepanned skulls have also been taken from a mound near Sable River, and from the large tumulus of the Red River, of which we have already spoken; but the perforations are generally smaller than those of the skulls from other mounds. The trepannings of Michigan, about which we have more complete details, were always made after death, and only on adults of the male sex¹; they are from one to two

centimetres in diameter, and usually occur at the sagittal suture,² generally at the point of junction with the coronal suture. They were obtained by means of an instrument, probably a pointed stone drill, which was turned round rapidly. We have noticed³ these perforations in Europe, especially in France, where they have been so completely discussed by

¹ Broca: "Rev. d' Anth.," 1876, p. 435.

² The sagittal suture unites the two parietal bones, and stretches from before backward along the median line. The coronal suture extends from one temporal bone to the other, above the crown, uniting the frontal to the parietal bone.

³ "Les Premiers Hommes," vol. II., p. 218 *et seq.*

Broca.¹ They were often surgical, and made upon the skull of the living (fig. 218). Every age and both sexes were subject to them. Their position, form, and length varied according to the wound or the nature of the malady they were supposed to relieve. Comparison between them and American trepannings is, therefore, difficult. A circular cranial perforation has also been mentioned in an American cranium, in every respect similar to those found in France by Dr. Prunières, but the discovery is thus far unique.

We must recur again to curious artificial deformation of the skull, of frequent occurrence in the north and south of the American continent. At the time of the Spanish conquest the greater number of the natives, especially those inhabiting the coasts of the Pacific, retained their ancient habit of compressing the head of their infants at the time of their birth.²



FIG. 218.—Perforated skull from the de Baye collection.

The most recent of these deformations, most fashionable, if we may use such a word, was the flattening of the forehead, so that the head is widened at the side, and looks as though displaced backward, the angle of inclination varying. There were yet others; at the first Congrès des Américanistes, held at Nancy, in 1875, were shown successively an Aymara skull from Bolivia, lengthened

¹ "Memoire lu en 1876 au Congrès de Buda-Pest," "Rev. d'Anth.," 1877.

² Wilson: "Prehistoric Man," vol. II., chap. XXI. Jones: "Ant. of Tennessee," "Smith. Cont.," 1876. Catlin: "North American Indians," vol. II., p. 40. Bancroft: "The Native Races," vol. I., II., and IV. Dr. Moreno ("Rev. d'Anth.," 1874,) has obtained in the cemeteries of Patagonia forty-five skulls of ancient Tehuelches, eighteen presenting a very marked deformation.

to a point; another of the same origin of cylindrical form; an Indian skull flattened from before backward so as to give the forehead huge dimensions; and, lastly, Patagonian skulls, one of which had been subjected to such pressure in the middle of the head that it presented a two-lobed appearance.

This custom dates from the most ancient races who peopled the country; nearly all the Mound skulls thus far discovered have the occiput flattened; but with them the deformation is, perhaps, of less exaggerated character than amongst the American races. Many of these deformations may be attributed to posthumous causes, such as the pressure of the earth upon the bones softened by moisture. Under one of the mounds of Utah, in the centre of that country which a few years ago was an absolutely unknown desert, a skull has been obtained showing a considerable artificial depression.¹ This deformation was practised among all the Maya races; the representations of the human form found in Chiapas, Honduras, and Yucatan, leave no doubt on this point (figs. 123, 124, 126, 128). The skulls taken by Dr. Flint from the caves of Nicaragua have also a very marked frontal depression.² The origin of this custom is unknown; but it is stated to have been introduced among men by the gods themselves. The idols all have curiously flattened heads. Recent excavations near Vera Cruz have brought to light some earthenware statuettes, in which this same deformation occurs, and which, according to the custom among Mexicans of the ruling class, have a pointed beard on the chin.

The means employed varied greatly. Sometimes the deformations were obtained by means of planks fastened on the head of the child. Our illustration (fig. 219) shows the martyrdom inflicted on these little creatures, which lasted eight or ten months, but apparently did not inflict much pain. We may reasonably suppose, from the shape of the

¹ "Report, Peabody Museum," 1871, vol. II., p. 199.

² "Report, Peabody Museum," 1880, vol. II., p. 716.

mother's head, that she wished to make that of her child like it.

In other cases bandages were wound round the head of the new-born. The Choctaws¹ used a little bag of sand, on which the head rested constantly.² The Mosquitos placed a plank on the skull of their infants as soon as they were a month old, and they increased the pressure until the result obtained was satisfactory. In Yucatan, four or five days after its birth the child was laid upon its stomach, and the head placed between two planks; one pressed the forehead and the other the occiput; and this position, which appears so cruel, was maintained without change for a considerable time.³

These grotesque customs do not appear to have injured either the health or the intelligence, nor should they surprise



FIG. 219.—Artificial deformation practised on a child.

us, for we meet with them on every page of ethnic history. Hippocrates⁴ speaks of a macrocephalic tribe living near

¹ Among the Choctaws, as among the Aymaras, cranial deformation was exclusively reserved for male infants.

² Adair: "Hist. of the American Indians," p. 284.

³ Oviedo y Valdes: "Hist. Gen. y Nat. de las Indias," Madrid, 1851-4, vol. IV., p. 54. Herrera: "Hist. Gen. de los Hechos de los Castellanos en las Islas i Tierra Firme del mar Oceano," dec. III., book IV., chap. VII.; Dec. X., book X., chap. III., Madrid, 1601. Squier: "Nicaragua," New York, 1860, vol. II., p. 341. Landa: "Relacion de las Cosas de Yucatan," Paris, 1864, pp. 114, 180, 194.

⁴ "De Aeris, Aquis, et Locis."

Palus Mœotis among whom the parents, at the birth of a child, endeavored to give an elongated form to the head; Strabo¹ mentions an Asiatic people among whom the forehead was forced out beyond the line of the chin by artificial means. Blumenbach saw a skull with this depression taken from a tumulus in the Crimea; another exactly similar was found near Kertch, so that it was a general practice. Such, too, was the custom of the Mongolian Avari,² if, as we suppose, we may attribute to them either the skulls of Grafenegg and Atzgerrsdorf near Vienna, or others discovered in various parts of Germany and Switzerland, in which the same deformation occurs. A medal struck in honor of Attila, 452 A. D., bears the bust of the "Scourge of God," in which the head is visibly depressed. A skull thus deformed, belonging to a skeleton of very great stature, has been found near the gate of Damascus at Jerusalem.³ Dr. Meigs recognized that the form was due to pressure exercised during infancy. This artificial modification of the head also existed among the Caledonians, Scandinavians,⁴ and Anglo-Saxons of the most remote ages.⁵ It exists in our own day in a great many of the islands of Oceanica. The shape of the head is even a means of recognizing the islanders, for the people of different islands have peculiar customs, transmitted from their ancestors and formerly religiously observed. Among the Flatheads it was an aristocratic privilege, and neither slaves nor men of inferior condition were allowed to adopt it for their children.

But without going so far, we still meet with this cus-

¹"Geographia," book I., chap. XIX.

²Retzius in noting the constant deformation amongst the Mongols pretends that it was introduced into America by Asiatic emigrants. "Archives des Sciences Naturelles," Geneva, 1860. "Smiths. Report," 1859, p. 270.

³This skull is now part of the collections of the Academy of Natural Sciences at Philadelphia. "Description of a Deformed Fragmentary Skull in an Ancient Quarry Cave at Jerusalem," "Trans. of Philadelphia Acad. of Nat. Sciences," 1859.

⁴Gosse: "Essai sur les déformations artificielles du crâne," p. 72.

⁵Thurman: "Crania Britannica," p. 38.

tom, at the present day in some parts of France, where it is known under the name of *déformation toulousaine*. It is obtained by pressing the head of the new-born with bandages. In the department of Deux-Sèvres there is a mode of compression different from the *déformation toulousaine*, and other examples might be given of such local customs. It is curious to find a practice, which at first sight appears so strange, existing amongst the ancient races of Europe, recurring among Asiatics, as well as among the most ancient inhabitants of America, perpetuating itself not only among the Indians,¹ or the wild islanders of Polynesia, but also amongst the most civilized races of Europe. This similarity between the most different races, even in the most grotesque practices, is a fact of deep significance, worthy of the consideration of all who are interested in the study of humanity.

One question has been raised. Was this depression always voluntary, or was it often the result of a method employed to hold or to fasten the new-born?² Garcilasso de la Vega³ relates that amongst the Peruvians the child was always laid in a wooden frame, furnished with plaited cords, to which he was fastened in such a manner as to check all his movements; he was never taken out of this bed, even to give him the breast, which was done regularly three times a day. Was the flattening of the skull the result of this, and involuntary? This is scarcely probable, and it seems certain that these people thought to add to their beauty by such deformations.

Others have gone further, and look upon it as a congenital peculiarity. "I am not afraid to assert," said Robertson, at

¹ Hence the name of *Flatheads* given to certain Indians of Northwest America. Compression was probably once a general custom among many Indians of the northwest, especially those of Vancouver's Island, the Quatsinos and Tsimpsians, where the perfect form appears to be that of the sugar loaf, the Chinooks, Sahaptins, etc. Amongst the Indians of the southern United States we may mention the Choctaws and Catawbias.

² Conant: "Footprints of Vanished Races," p. 102

³ "Hist. des Incas, rois de Pérou," chap. XII., Paris, 1744.

the Congrès des Americanistes,¹ "that the flattening is the result not of an artificial compression, but of a law of nature." This is entirely an error, contradicting alike physiological laws and historical facts; it would scarcely deserve mention, if we were not determined to place before our readers all the hypotheses which have been put in circulation, however unfounded they may appear.

We have now given a summary of the existing information in regard to the human bones found in America, and which are supposed to date from pre-historic times. What conclusions may we draw from these discoveries? What general laws are we justified in evolving from them? One primary conclusion naturally presents itself. The American, no matter how remote the antiquity to which he may be assigned, hardly differs from the men who now inhabit the shores of the Atlantic and Pacific. The fauna and the flora are changed; climatic and biological conditions have undergone profound modifications; man alone if not entirely unchanged has yet remained without serious differences, similar in his bony framework, similar in his physique and in his pathological affections. Everywhere he has had to submit to the stern laws of life, he has gone through the same struggles, and where possible he has been led to similar progress. A second conclusion is no less important. Between the men of the New World and those of the Old there exists no essential physical difference. The unity of the human race stands out as the great law dominating the history of humanity.

Doubtless, as with the ancient races of Europe, those of America were made up of diverse elements, of different varieties.² A primeval dolichocephalic race appears in the first instance to have invaded the vast regions included between the two oceans. The men of this race were contemporary with the huge pachydermal and edentate animals; and, as did their contemporaries in Europe, they

¹ "Les Mound Builders," 1877, p. 34.

² Bordier: "Bull. Soc. Anth.," January, 1881.

passed through the various phases of the Stone Age. Other races arrived in successive migrations, the first of which doubtless dated from very remote ages,¹ and brought about, amongst the ancient inhabitants of America, modifications, analogous to those produced in Europe by similar migrations.

Doubtless many points still remain obscure and insoluble ; whichever side man turns, it has been said,² whether he looks into the past or into the future, whether he scrutinizes the sidereal universe or interrogates the vestiges and mutilated documents of the history of life on this planet, if he wishes to start from some settled or assured point, if he seeks an immovable foundation, a corner-stone, he will not find it. We readily endorse these words ; man by his unaided powers will never be able to solve the great questions of our origin and our end, of primary or of final causes. The intelligence of Man, however admirable it may be shown to be by the ceaseless progress of humanity, is limited. The infinite stretches before him ; man is unable to grasp it.

¹ "Hence we find Mound skulls with this ancient form, associated with others of more modern type. The discovery of these skulls, with characteristics so much like those of the most ancient of the pre-historic type of Europe, would seem to indicate that if America was peopled by emigration from the Old World, that event must have taken place at a very early time, far back of any of which we have any record." "Letter of Dr. Lapham to Dr. Foster," Conant, *l.c.*, p. 108.

² J. Soury : "Int. à l'Hist. des Protistes de Hæckel," p. 6.

CHAPTER X.

THE ORIGIN OF MAN IN AMERICA.

IN the preceding pages¹ we have reviewed the existing knowledge of ancient man in America. His temples, fortresses, dwellings, monuments, agricultural and hydraulic works, his personal characteristics, and even the relics of his dinners have been described in detail. This task being ended the inevitable question presents itself: Who and whence was this primitive man? Was he original to the soil of the New World? If not, how did he reach it, and what was the cradle of his race?

It may be stated at the outset that our knowledge of primitive man in America suffices only to decide that he existed here, in a state of the lowest barbarism and but little elevated above the brutes, at an exceedingly distant epoch. While in this condition he has left his traces over both Americas, and that at a time which was probably contemporaneous with the existence of the mammoth (*elephas*) if not with its perhaps somewhat older relative, the mastodon.

That this primitive man was not original to America is probable on biological grounds. With those who believe in the spontaneous generation of large, highly organized mammals out of inorganic material, we have no argument. Those who accept the results of science, believing that the present lawful sequence of organic nature is at once an exemplar and epitome of the progress of nature in the past, and that the methods of the Author of nature are best comprehended by studying them and their results,—will better comprehend the weight of the reasoning by which we are

¹ For the present chapter the American editor is chiefly responsible.

led to decide against the existence of autochthonous man in the New World.

The naturalist thus far has met with no traces of the higher anthropoid animals in America either recent or fossil. The American monkeys, it is admitted, are of a relatively low structural rank.

On the other hand in various parts of the Old World, especially in Africa and some of the Asiatic islands, anthropoid animals approximating much more nearly to man in physical structure are well known to exist. The fossil remains of anthropoids of a tolerably advanced type are also more numerous, though these fossils are of such a nature, and the region possesses such climatic features, as to render their preservation at all rather a happy accident than an occurrence to be confidently anticipated. The insanitary and tropical character of the countries mentioned is also a serious obstacle in the way of geological research and the collection of fossil remains which might be happily preserved in later formations.

No biologist of standing, we believe, would affirm that the physical structure of primitive man was developed from that of the anthropoid animals now in existence, or now known to have existed. But, other things being equal, it is probable that such a physical structure would find more favorable opportunities for its evolution in a region favorable to the evolution of allied types; such as the countries referred to are proved to be, not only by the actual occurrence of such types, but by the climate and eatable products which would serve as sustenance.

What changes in the area of land and water have taken place since the progenitors of man appeared upon the earth we do not know, and any hypothesis must take this uncertainty into account. But judging from the facts as known to us we are justified in deciding against the probability of an American origin for the human race.

Excavations in the middens and shell-heaps of all parts of the world indicate that man, at an epoch when his culture

was of the lowest, had already extended his geographical range over an immense area. It is impossible to fix a date for this extension of the race or to apply any other than an approximate geological chronology to the period of his wanderings and his conflicts with the cave bear, the reindeer, and the mammoth.

It must also be remembered that the duration of the state of culture we refer to was very unequal in different regions and probably with different races or geographical assemblages of men. To this day in the remote corners of the earth it still persists and doubtless is not very different from that which characterized the progenitors of the Aryan race before the earliest dawn of civilization anywhere. It is notable that this persistence of savagery goes hand in hand with an inhospitable environment. We find it in the bleak and icy deserts of the north; in the famine-stricken wilds of Tierra Fuego, where the struggle for mere existence is so bitter that unproductive members of the community are promptly swept away by cannibalism; and on the arid sands of Australia, where the most extraordinary devices to secure infertility in most of the male members of a band, have been resorted to in the attempt to repress population within limits approximated to the supply of food.

From this fact we may suppose that among those men gifted with a tendency to progress, such of them as found themselves in a hospitable environment would tend to advance in culture. On the contrary, those who had to struggle for a bare existence and live in a constant state of reaction from their surroundings, would find no time for culture except that directly applicable to their sustenance, and would be more likely to spend an occasional breathing-spell in idleness or sensual pleasure than in inventive or æsthetic work. For all, in their early stages of culture, long enduring, intense labor was the price of every thing.

At first lawless, hardly even social, chiefs and leaders, except as heads of families, were unknown. Religious

ideas at this stage could hardly exist; the family turned to its leader as the herd turns to the sturdiest bull; a crude and unthinking materialism born of man's relation as a preying animal to the world about him considered as a source of supply, with occasional irrational stampedes, as of wild horses, from sudden alarms begotten of unfamiliar phenomena; a terror of the darkness, of the swift torrent, of the falling tree or avalanche; rage, jealousy, fear; the pairing instinct; gluttony;—these, and such as these, were the lights and shades in the mental radiations of the savage brain. Progress from the real or formalized family to the band or clan, and so upward, would follow; its phases have been classified by the lamented Morgan and many others. Too often, however, the view of savagery has been subjected to a strange refraction in penetrating the haze of a later culture which surrounds the observer. Only in these last days are we come to recognize, even now but dimly, the primitive savage in his lair. As man developed culture he was perhaps more successful, more physically comfortable, but not more happy. It may be said that physical comfort, a full belly, and a warm, well-tanned robe, is the highest happiness of a savage. We think this might have been true for the primitive savage, who was not comfortable, but not for his successor who had begun to think and to dream. A mole is probably happier than a fox, either of them than the primitive man who had begun to question nature.

The primitive man was a slave to nature, in continual terror before dangers which he did not understand and could not guard against.¹ Nature to him was an appalling mystery out of whose bowels any thing might issue. He lived in a haze of feticism. Not a leaf might flutter, not a rabbit cross the path, no distant thunder roll, or raven croak unseen, but heralded to him some spirit only too malign.

Those who have observed in a distant camp or remote village of savages the midnight alarms, the whispered fears, the wild unfounded rumors, the cowering before the most

¹ Prof. W. G. Sumner; "North American Review," June, 1884.

simple physical phenomena if only unfrequent,—only those can have a realizing sense of the horrors nature enfolds for the ignorant yet thinking savage. But it is not our purpose to trace the stages of mental culture, a task for which the material is yet imperfect; though glimmerings of the truth have lately broken through the mists of misconception which have so long prevailed.

For the purpose of the conservative ethnologist, desiring to give to the public a general view of what is known or surmised with a degree of probability on this difficult topic, it will suffice if we allude to the physical characteristics of the different pathways to the American continent, to the indications of successive waves of migration in America and their lines of march; and briefly refer, as a matter of curiosity, to the myths of origin of some American tribes; and, as a warning to the enthusiast, to some of the preposterous and unscientific hypotheses which men of good literary standing, but without sound anthropological training, have adopted and disseminated.

The physical characteristics of the American aborigines are generally admitted to point toward affinities with people belonging to the Pacific region, rather than with those bordering the opposite coasts of the Atlantic basin. The nomads and fishermen of Siberia are more like hyperboreans than any existing European people, and certain features recall the Melanesian inhabitants of the Pacific islands rather than the African negro races.

The approximation of Asia and America at Bering Strait lends probability to this hypothesis on the north, and the prevalent winds and currents together with the distribution of islands, help it on the south. It has been shown¹ that the route to America *via* Bering Strait is feasible (though that so often referred to, *via* the Aleutian Islands, is not), and in glacial times if the shallow waters near the strait were, as there is some reason to suppose, filled with grounded

¹ Contributions to "North American Ethnology," vol. I., Washington, 1877, pp. 95-98.

ice, there is no reason why people like the Eskimo of the present day, or even lower in the scale, might not make their way along this temporary bridge and subsist on the marine animals which probably swarmed along its borders.

On the other hand, a knowledge of navigation no better than that possessed at present by the lowest people of Melanesia would have enabled a migration on the line of the thirtieth parallel, south, to reach the coast of South America and, in time, to give it a considerable population. A different distribution of land and water from that at present existing, is a possible factor in the problem, but of which it is too early in ocean exploration to avail ourselves.

Squier, Gibbs, and numerous other American ethnologists believed in a migration from the west to South America. A northern migration is almost universally considered to have taken place. Probably the American races entered by both gates.

Of their spread afterward it is impossible to speak with confidence, except as to the fact that they did spread over both Americas while in a very low stage of culture. This is undeniable. More than this it is likely will never be certain. That the nations of to-day which now populate the western shores of the Pacific and many of its islands were, either in physique or culture, the same as we know them is as little likely as that the original invaders of America had the culture of the Aztecs or the physique of the Apaches. To say then that the Americans are derived from the Chinese, the Japanese, the Malays or the Polynesians, is highly unscientific and inaccurate. Theoretically it is probable that the language, the physique, the social and religious culture, and the geographical distribution of all these peoples, have undergone radical changes since that early time, and that since their present stages or any approximation to them have been attained, migration to America has not been in progress.

That successive waves of migration occurred there is no reason to doubt, and that these successive bodies of immi-

grants differed to some extent in culture and in race is highly probable, but that the distinctively American culture which may be traced from the shell-heap to the mound, from the mound to the pueblo, from the pueblo to the structures of Mexico, Central America, and Peru, irrespective of race,—that this is indebted to an equivalent foreign culture for its chief features, is utterly incapable of proof in fact and highly improbable in theory.

That, irrespective of race as indicated by physical and linguistic characteristics, certain distinctive items of culture have spread over wide geographical areas in America, has lately been sufficiently shown,¹ and it is highly probable that something similar will prove to be true of many more. From the nature of the human mind and the natural direction of its evolution, follow very similar results up to a certain more or less advanced stage in all parts of the world. At that stage, wherever it may differentiate itself in the normal line of progress, begin those features which characterize a stock or race as opposed to man in general. Color was probably the first feature to become distinctive, other modifications of physique in turn responded to the environment, and this process can hardly be said to have ceased even among the most civilized races. It is a normal natural process, such as might be traced among the brutes. But when man's mental powers had reached a point when he could look to posterity as well as ancestry, when he could crystallize his ideas in stone to convey his methods and memory to future generations, then a new category of facts by which he might be classified, arose, and by these is he most truly differentiated.

The ordinary idea of race is a consensus of facts relating to the two categories, and as a means of classification more or less confusing, although at present the best we have. That a better will be found eventually there is little doubt.

¹ "On masks, labrets, and certain aboriginal customs, with an enquiry into the bearing of their geographical distribution" Third annual report, Bureau of Ethnology, 8° Washington, 1884.

The origins of language belong to the first category, its final differentiations to the second. By the introduction of writing, different languages have been petrified, so to speak, in various stages more or less mature.

By the physical category, America gives evidences of many races, not to mention innumerable linguistic stocks; by the mental category a much greater degree of unity is indicated, as we think will be evident to those who have followed the author through the preceding pages. It will be still more plain to those who have kept abreast of the recent wonderful progress in the essentials of American anthropology, too recent, too extensive, and still in part too tentative, to be summarized here.

Attention has been frequently called in the preceding pages to the similar manner in which similar needs were met, similar artistic ideas developed, and similar results attained by people in widely separated parts of the globe. That from these similarities, no special homologies can be drawn, is a fundamental canon of scientific anthropology, from the neglect of which science has suffered much. That these facts testify to the fundamental unity of the human race and to the analogous processes of evolution through which distinct communities have reached a higher plane of culture is generally admitted, but in the absence of connecting links their significance goes no farther.

That these analogies should be found, not merely in the material products of the man's hands and brain, but also between his conceptions, legends, and myths, is not surprising or unexpected. From many such cases the following instances are selected with the caution that for them we are dependent upon writers not always free from mental bias, and who often derived their information from individuals who had been subjected to missionary teaching, and were more or less familiar with the myths and legends of the superior race. Notwithstanding these disadvantages, it will be seen that a general belief, for instance, in a deluge or flood is widely spread among American races, and can hardly be attributed to Christian teaching.

Ixtlilxochitl, the Christian descendant of the ancient rulers of Anahuac, relates that after the dispersion of the human race which succeeded the attempt at building the Tower of Babel (which he had learned from his Catholic instructors), seven Toltecs reached America, and became the parents of a numerous race. The Qquiches speak of white men who came from the land of the sun.¹ The people of Yucatan believed that their ancestors had come from the East, across a great body of water that God had dried up to let them pass over.

From the East, too, came Zamna, the disciple and emulator of Votan, and Cukulcan, the founder of Chichen-Itza, probably the same person as Quetzacoatl.² Both preached celibacy and asceticism to the people of Yucatan, and were claimed to be the initiators of their culture. At their death the grateful people erected temples to them, and adored them as gods.³

There are also some interesting traditions amongst the Indians. The Shawnees are said to have claimed that the ancient inhabitants of Florida were white, and that when they arrived in the country they found there buildings and customs, with a civilization very unlike their own. The Natchez believed that they received their religion and their laws from a man and woman sent by the sun.⁴ The Tuscaroras are said to possess a legendary chronology going back nearly three thousand years; according to them, their fathers were natives of the extreme north, of districts far beyond the Great Lakes; they established themselves upon the St. Lawrence; a strange people came by sea, and long and bloody wars ensued between them and the new arrivals. It is probable that all these traditions have some foundation in truth.

¹ Brasseur de Bourbourg: "Hist. des nations civilisées du Mexique et de l'Amerique Centrale," vol. I., pp. 105, 106, 166.

² Cukulcan and Quetzacoatl both signify *the serpent covered with feathers*.

³ Landa: "Relacion de las Cosas de Yucatan," p. 28. Herrera: "Hist. Gen. de los Castellanos en las Islas i Tierra Firme del Mar Oceano," dec. IV., book IV., chap. II. Cogolludo: "Hist. de Yucatan," p. 178.

⁴ Du Pratz: "Hist. of Louisiana," vol. II., p. 175, London, 1703.

In South America we also find accounts which attribute the origin of the people, or at least that of their civilization, to strangers. The Peruvians attribute their progress to Manco-Capac and to the beautiful Mama-Cello, his sister and his wife, who had crossed the sea to their country.¹ In another part of Peru it was believed that three eggs had fallen from the sky; the first was of gold, the second of silver, the third of copper. From the first sprang the curacas or chiefs, from the second the nobles, and from the third the people.² Another tradition relates that a white man, wearing a long beard, had taught the inhabitants the art of building houses and sowing seeds, after which he disappeared, to live for two thousand years in retreat before re-appearing upon the earth.

The Guaranis relate that two brothers, Tupi and Guarani, landed on the shores of Brazil after a great flood, with their women and children, and it is from them that sprung the races bearing their names.³

Other traditions allude to convulsions of nature, to inundations, and profound disturbances, to terrible deluges, in the midst of which mountains and volcanoes suddenly rose up. Some of these legends relate to a universal flood, a myth "spread throughout the New World, from one pole, so to speak, to the other."⁴

We reproduce as nearly as possible the naive account given by Bishop Landa.⁵ "The water" he says "then became swollen, and there was a great inundation, which reached to the top of the heads of the inhabitants; they were covered with water, and a thick resin came down from

¹ Squier: "Peru, Incidents of Travel and Exploration in the Land of the Incas."

² Avendano: "Serm.," IX., p. 100. Desjardins: "Le Pérou avant la conquête Espagnole," p. 29.

³ Guevara: "Hist. del Paraguay, en la col. Hist. Argentina," vol. I., p. 76.

⁴ D'Eichthal: "Etudes sur les origines Bouddhiques," 1st part, p. 65.

⁵ "Relacion de las Cosas de Yucatan." Diego de Landa, a Franciscan monk of the house of Calderon, was the second bishop of Merida.

the sky. The face of the earth was darkened, and a black rain began; rain by day, rain by night, and there was a great noise above their heads. Then were seen men running and pushing each other; filled with despair, they wanted to climb the trees and the trees flung them far from them; they wanted to enter the caves and the caves fell in before them."

The Chimalpopoca Codex¹ also gives an account of a deluge, in which men perished, and were changed into fish. In one day the earth disappeared; the loftiest mountains were covered with water, and remained beneath the billows for a whole spring. But before this disaster, Titlahuacan, one of the Nahua gods, often called Tezcatlipoca, had called Nata and his wife Nena. "Do not busy yourselves any longer," he said to them, "in making pulque,² but in the month Tozotli hew out a large cypress, and when you see the waters rising toward the sky, make it your home." Nata and Nena obeyed these divine orders. They fed upon maize during the time when their boat floated on the water; at the end of the allotted time this boat stood still, and for the first time they saw a few fish. They hastened to seize them and to roast them on a fire, which they made by rubbing two pieces of wood together. But the gods complained of the smoke which reached them, and the irritated Titlahuacan hurried to the earth, and changed the fish into dogs.

Another Mexican tradition³ tells us that Coxcox and his

¹ Bancroft *l. c.*: vol. III., p. 69.

² A fermented drink made with the sap of the aloe, and known in Mexico, where it is still in use, under the name of *octli*.

³ We give Clavigero's version, reproduced by Humboldt and Lord Kingsborough; but according to more recent works it is a mistaken interpretation of the map of Gemalli Carreri (Churchill "Coll. of Voyages," vol. IV.), from which it is borrowed. The painting dedicated to this tradition would represent the departure and migrations of a tribe amongst the lakes of Anahuac. We see a bird perched upon a tree, and at the foot of this tree a crowd of men all looking one way and ready to start on their journey. The name of this bird, *Tihuitochan*, and its cry, *Tihui*, which signifies in Aztec language *We must start*, are probably the origin of the legend which we relate; but it is not mentioned by any of the more ancient historians, such as Sahagun, Mendieta, or Ixtlilxochitl.

wife Xochiquetzal alone escaped the deluge; they took refuge in the hollow trunk of a cypress, which floated upon the water, and stopped at last on the top of a mountain of Culhuacan. They had many children, but the children were dumb. The great spirit took pity on them and sent them a dove to teach them to speak; this dove hastened to fulfil its mission; fifteen of Coxcox's children succeeded in understanding it, and it is from them that the Toltecs, Aztecs, and Acolhuas are descended. We meet with a legend somewhat like this in Michoacan; only the name of the man preserved from the deluge is different; he is called Tespi, and the bird that is the harbinger of fine weather is a humming-bird. In Guatemala and California the most ancient traditions of the natives preserve the memory of a great inundation; and according to the inhabitants of the Isthmus of Tehuantepec, the world was repopled by a man and woman rescued from the waters that covered the whole country.

The Peruvians also have several legends relating to a great deluge. At Quito, it is said that in very remote ages the waters had invaded the land, as a punishment for the crimes of men; a few of them had been spared, and these had retired to a wooden house on the top of Pichincha. At Cuzco the sun interfered, and hid those who were to be saved in the Island of Titicaca. According to a tradition preserved at Pachacamac, the entire country was covered with water some centuries before the time of the Incas; a few men took refuge in the mountains, and when the water began to go down they let loose some dogs, which came back wet; a few days later they were sent forth a second time, and came back soiled with mud. At this sign the men knew that the waters had retired; they left their retreat, and their posterity peopled the country.

A still more strange account is that telling how a shepherd, noticing that the llamas passed the night looking at the stars, questioned one among them as to the cause of his preoccupation. The llama called his attention to the un-

usual conjunction of six stars, adding that this conjunction was a sure sign that the world was soon to be destroyed by water and that if his master wished to escape becoming the victim of the approaching catastrophe he must take refuge with his family and flock on the neighboring mountains. The shepherd hastened to follow this advice, and withdrew to the loftiest mountain¹ of the country, where a crowd of animals had already preceded him. He had scarcely arrived when the angry waves covered the earth, but the mountain floated like a boat, and rose as the waters increased. This deluge lasted five days, and was accompanied by a total eclipse of the sun. Then the waters gradually retired, and the shepherd and his family became the ancestors of the Peruvian people.²

Other traditions, chiefly met with in the countries forming the present republic of Ecuador, make two brothers who took refuge from the waters on the mountain of Huacayñan, the fathers of the whole human race. Their provisions were exhausted, and they were obliged to leave the miserable hut where they had found a refuge, to go into the half submerged valley. On their return they were astonished to find a meal prepared for them. Curious to know who had thus come to their assistance, one of the brothers only went out the next day, while the other kept watch. He soon saw two birds called aras, in the form of women,³ approaching, loaded with provisions. He succeeded in seizing one of them, who became his wife, and mother of the human race.

Lastly in Brazil a god named Monan, angry at the corruption of men, destroyed the earth by water and by fire. One man alone escaped, in the destruction of all living creatures;

¹ According to some, the mountain of Ancasmarcha five leagues from Cuzco, according to others Mount Huarocheri nearer the sea.

² Molina, "Relacion de las fabulas y Ritos de los Ingas," MS. des arch. Madrid.

³ Brasseur de Bourbourg, who relates this legend, says that there were two women called *Ara*. He adds that the people of this province retain a great veneration for the Aras, on account of the service which birds had rendered to their ancestors.

Monan took pity on his misery and gave him a wife, and it was they who repopled the earth after these terrible events.¹

Similar myths are found among various Indian tribes; the legend of a deluge and of a saviour and benefactor of the human race extends to the Alaskan tribes and is in fact almost world-wide among all classes of men in some form or other. No dissemination of merely Christian ideas, since the conquest, is sufficient to account for these myths, which appear to have their root in the natural tendencies of the human mind in its evolution from a savage state.

That America was peopled at different times by scions of different races is highly probable from the physical differences to be observed between the remains of pre-historic man and the complexion and features he bequeathed to his historic descendants. That these races were still in a very low and undifferentiated state, other than in their physique, we have already stated as probable.

Among the crude and imperfectly digested hypotheses which have engaged the attention of untrained ethnologists, none have been more popular than those which ascribed the origin of the Americans to full-fledged races such as we know at present in other regions of the world. Among those who have been claimed as the original or genuine ancestors of the Americans are the Chinese, the Japanese, the Malays, the Egyptians, the Phœnicians, the Basques, the ten lost tribes of Israel, the early Irish, the Welsh, the Norsemen, some unknown Asiatic freemasons, and other equally unknown Buddhists. Volumes have been filled with the most enthusiastic rubbish by men upon whose ability and sanity in other matters, nothing has ever thrown a doubt. Fortunately the era of such speculations is passing away. The scientific treatment of anthropological subjects is no longer the exception.

The "ten lost tribes" still linger with us, and doubtless will continue to do so for some time, probably becoming in

¹ P. Thevet, Cordelier, "Les singularités de la France Antarctique autrement nommée Amérique," Paris, 1858.

their turn the subject of investigation by psychologists interested in aberrant mental phenomena. But every day increases our knowledge of the true constitution of savage society, and builds a more enduring barrier against the floods of pure hypothesis. Students are less and less likely to be fooled by such a preposterous fiction as the so-called history of Moncatch Apé, which, within a few years has engaged the serious attention of some of the most worthy and distinguished European ethnologists; and the day is not far distant when men possessed by absurd anthropological hobbies will no longer be patiently permitted to ventilate them before scientific bodies, but will be placed on the same list with the squarers of circles and the discoverers of perpetual motion.

Many of these hypotheses were discussed at length, with a view to their refutation in the French edition of this work, by its learned author. It has been thought best to omit the discussions as, in the interval which has elapsed, they have come to bear still less relation to the actual state of the science; and, further, because American students, having the advantage of being on the ground, have pretty well discarded many ill-founded notions which still linger among the less enterprising of European anthropologists.

This translation being intended for the American public has, therefore, been brought as nearly in unison with the present state of science in this country as the rapid progress of such studies would permit, and, it is hoped, will convey to many general readers a not uninteresting survey of the class of facts upon which the scientific conception of Pre-historic man in America is based. That there is much to learn is self-evident, that a beginning has been made is certain, that the results in the end will testify to the orderly reign of evolution here as in the Old World we have every reason to be confident.

APPENDIX.

A.—DISCOVERIES IN CALIFORNIA.

WE think it will be useful to give a summary of the principal discoveries made in California, and to add to it a list of the mammals whose remains have been found on the coasts of the Pacific, in strata ascribed to the quarternary period.

Mariposa county, mastodon bones mixed with human bones and stone weapons, the most remarkable of the latter being an obsidian lance-point, five inches long.

At *Hornitos* and *Princeton*, stone mortars with their pestles, one of the mortars eighteen inches high and weighing fifty pounds, being one of the largest known; obsidian arrow and lance-heads, together with bones of the elephant, horse, and an indeterminate species resembling the camel.

Merced county, numerous implements from near Snelling.

Stanislaus county, an elephant's tusk, ten feet long.

Tuolumne county, wagon-loads of mastodon bones; numerous stone objects. In all the auriferous gravels have been found bones of extinct animals associated with the products of human industry. The greatest depth of the excavations yielding profitable results here was two hundred feet.

Under the basaltic deposits of Table Mountain has been discovered a human jaw, together with two lance-heads, a pestle, and several stone objects resembling our ladles.¹ A human skeleton was found in cutting a tunnel beneath Table Mountain,² but details respecting it are as yet too incomplete to justify any conclusion.

Amador county, various stone objects.

El Dorado county, at Shingle Springs, stone mortars and mastodon bones; at Diamond Springs, mortars; at Spanish Flat, "Tools, kitchen utensils, and other indestructible traces of man's presence and activity," says Voy, one of the most indefatigable excavators of California. Some human bones have been picked up in a bed of clay.—(Letter of Dr. Boyce, Nov. 2, 1870.)

Placer county, near Gold Hill numerous stone objects; at Forest Hill, a dish hewn out of very hard granite, measuring about eighteen inches in diameter; at Devil's Canon, two human bones beneath a thick bed of lava.

Nevada county, numerous objects fabricated by man have been picked up between 1853 and 1864.

¹ "Scoops, or ladles with well-shaped handles."—Whitney, "Auriferous Gravels," p. 264.

² *Proc. Boston Soc. of Nat. Hist.*, vol. XV, 1873, p. 257.

Butte county, the first discoveries were made more than twenty years ago ; they consisted of instruments, weapons, and implements of the most varied form.

Some traces of the contemporaneity of man and of animals of extinct race have also been made out in *Trinity* and *Siskiyou counties*. It is very probable that later researches will complete the discoveries already made.

The bones of which we have still to speak were none of them found in their natural position ; they had evidently been brought down by tumultuous waters, which the bones of the strongest mammals alone were able to resist.

Some of these bones have been picked up under thick beds of basalt or lava. In these beds we note no fissure which could justify us in supposing that the bones can have gained access to the places where they lay after the deposit of volcanic material. The species discovered under such conditions are very few. Thus far but three are mentioned in any thing of an intact condition¹ : a rhinoceros (*R. hesperus*) related alike to the *R. indicus* and the *R. occidentalis*, but decidedly smaller than the latter ; the *Elotherium superbum*, a species probably related to the *Elotherium ingens* of Dakota ; and lastly a pachyderm, of which all that has been found is one fragment of one tooth. In speaking of it Leidy says : " Apparently the fragment of an incisor or canine of some large pachyderm ; not the mastodon or elephant, and probably allied to the hippopotamus."

Quaternary species are of course more numerous. Amongst them we will mention :

Felides, *Felis imperialis*.

Canides.—A wolf that Dr. Leidy thinks is the *C. indianaensis*, found together with the megalonyx on the banks of the Ohio.

Bovides ; *B. latifrons*.

Camelides.—In Merced county Voy found a llama (*Auchenia californica*) of very large size ; some teeth from the Alameda county appear to belong to a smaller species (*A. hesterna*).

Dr. Snell possesses in his collection the molar tooth of a large ruminant found near Sonora ; it resembles a tooth picked up near the Niobrara river, and attributed by Dr. Leidy to a species to which he proposes giving the name of *Megalomeryx*, but which is very likely the same as the *Procamelus*.

Caprides.—None of the bones found belong incontestably to this group.

Cervides.—All that is known of this group is a metatarsus from Mariposa county, belonging to a deer smaller than the *C. virginianus*.

Proboscidiens.—We have already said how numerous these were in California. During the tertiary and probably also during a great part of the quaternary periods they wandered freely throughout North America as far as Labrador.* The greater number are related to *M. americanus*. On account of certain slight differences, however, Dr. Leidy has thought of creating three new species *M. mirificus*, *M. andium*, and *M. obscurus*.

¹ J. Leidy : " The extinct Mammalian Fauna of Dakota and Nebraska," Philadelphia, 1869. " Contributions to the extinct vertebrate Fauna of the Western Territories," *Report of the U. S. Geological Survey*, Washington, 1873.

* " Cart loads of Mastodon bones have been accumulated at various places between Sonora and the Stanislaus river at workings in the limestone crevices," Whitney : " The Auriferous Gravels," p. 251.

Elephants (*Elephas columbi*, Falconer) were less numerous than mastodons. A complete skeleton has been discovered near the Fresno river; its vertebral column was more than twenty feet long.

Equus.—Many are known. *E. excelsus* found at Santa-Maria oil springs, *E. caballus*, recalling the horse of the present day, and lastly, *E. pacificus*, the largest of all the Californian species, found in Contra Costa county, and which Whitney even ascribes to the pliocene period.

To complete our study we give a list of the flora whose presence has been made out in the auriferous gravels and deposits of Table Mountain.¹

<i>Fagus antipofi</i>	<i>Aralia zaddachi</i>
<i>Quercus eloenoides</i>	<i>Cornus ovalis</i>
<i>Quercus convexa</i>	<i>Acer bolanderi</i>
<i>Salix Californica</i>	<i>Ilex prunifolia</i>
<i>Platanus dissecta</i>	<i>Zizyphus microphyllus</i>
<i>Ulmus californica</i>	<i>Rhus typhinioides</i>
<i>Ulmus affinis</i>	<i>Rhus metopioides</i>
<i>Ficus microphylla</i>	<i>Rhus dispersa</i>
<i>Persea pseudo-carolinensis</i>	<i>Cerocarpus antiqua</i> .

B.—SPECIES FOUND IN THE SHELL-HEAPS OF MAINE AND MASSACHUSETTS.

	Mount Desert.	Couch Cave.	Eagle Hill.	Cotuit Port.
<i>Homo</i>	—	—	—	I
<i>Cervus canadensis</i>	I	—	—	—
<i>Alces americanus</i>	I	I	—	—
<i>Rangifer caribou</i>	—	I	—	—
<i>Cervus virginianus</i>	I	I	I	I?
<i>Ursus americanus</i>	—	I	—	I
<i>Canis occidentalis</i>	I	—	—	—
<i>Canis (species domesticata)</i>	I	—	I	I
<i>Vulpes fulves</i>	—	—	—	I
<i>Felis sp</i>	—	—	—	I
<i>Lutra canadensis</i>	—	I	—	—
<i>Putorius vison</i>	—	I	—	I
<i>Mustela americana</i>	—	I	—	—
<i>Mephitis mephitis</i>	—	—	—	I
<i>Phoca vitulina</i>	I	I	—	I
<i>Castor canadensis</i>	I	I	I	—
<i>Arctomys monax</i>	I	—	—	—
<i>Alca impennis</i>	I	I	—	—
<i>Alca torda</i>	I	—	—	—
<i>Anser (species duo)</i>	I	I	—	—
<i>Piscis squaloideus</i>	—	—	—	I
<i>Morrhua americana</i>	I	I	I	—
<i>Lophius americanus</i>	—	I	—	—
<i>Buccinum undatum</i>	I	I	—	—
<i>Busycon canaliculatum et B. carica</i>	—	—	—	I
<i>Ostrea edulis et Mya arenaria</i>	I	I	I	I
<i>Venus mercenaria</i>	—	I	I	I
<i>Mytilus edulis</i>	I	I	I	I
<i>Pecten tenuicostatus et P. islandicus</i>	—	I	—	I
<i>Mactra sp</i>	—	I	—	—

¹ Whitney, *J. c.*, p. 235.

C.—SPECIES FOUND IN THE SHELL-HEAPS OF IOWA.

		Keosauqua	Sabula	Bellevue.
Mammals.	<i>Bos americanus</i>	—	—	I
	<i>Cervus virginianus</i>	I	I	I
Birds.	<i>Bernicla canadensis</i>	—	I	—
Chelonian	<i>Chelydra serpentina</i>	I	I	—
Reptiles.	<i>Trionyx ferox</i>	—	I	—
Fish.	<i>Pimelodus</i> (?)	—	I	—
	<i>Embiotoca</i> (?)	—	I	—
Mollusca.	<i>Paludina integra</i> , Say	I	I	I
	<i>Unio æsopus</i> , Green	I	—	—
	“ <i>anodontoides</i> , Lea	I	I	I
	“ <i>crassus</i> , Say	I	—	I
	“ <i>ebenus</i> , Lea	—	I	I
	“ <i>gibbosus</i> , Barnes	—	I	I
	“ <i>nodosus</i> , Barnes	I	I	I
	“ <i>ovatus</i> , Say	I	I	I
	“ <i>plicatus</i> , Say	I	I	I
	“ <i>pustulosus</i> Lea	I	I	I
	“ <i>rectus</i> , Lamark	I	—	—
	“ <i>rugosus</i> , Barnes	I	I	I
	“ <i>tuberculatus</i> , Barnes	I	—	—
	“ <i>undatus</i> , Barnes	I	I	I
	“ <i>ventricosus</i> , Barnes	—	I	I

NOTE ON RECENT INVESTIGATIONS IN PALENQUE BY CHARNAY.

The occasion of conferring the Legerot prize, the gold medal, for new explorations in Mexico and Central America, by the Société de Géographie of Paris, is fully reported upon in the Society's Bulletin for the present year (pp. 268-277). The recipient, M. Désiré Charnay, has long been engaged in ethnological researches, to which reference has been made in the preceding pages. His work, which, at last advices, was on the point of publication, has been crowned by the Society; and in the report of the committee upon this matter, some of the important results attained are briefly summarized. Like all scientific investigations, their tendency is to refute much sensational closet-ethnology and to indicate more clearly than ever the unity of aboriginal culture in America.

Some of the facts brought out are of such interest that it has seemed well at the last moment to include them in the present appendix. Their bearing upon some of the problems discussed in the chapters on Central America and Mexico will be evident to our readers.

In visiting Palenque, M. Charnay made great use of a convenient process, by which moulds of bas-relief sculpture can be taken in a few moments. It consists in the application of tow sopped in liquid plaster, which can be laid on in a thin layer, the threads of the tow making the plaster extremely tough when set, and the lightness of the mould greatly facilitating transportation, always so expensive and difficult for large ethnological objects. An extensive set of reliefs from these moulds is on exhibition in the United States National Museum at Washington.

The moulds of M. Charnay have entirely done away with the elephant

sculptures reported by Waldeck on which so many pretty theories have been erected. There is absolutely nothing elephantine there, and it seems that the earlier reports were based on a misconception, due to extraneous vegetation lichens or stalagmites which have encrusted part of the ruins.

It appears that Palenque, so far from being in forgotten ruins at the time of the Spanish Conquest, as has been so often stated (after Waldeck), was the city of Teoticcac, the religious metropolis of the Acaltecs, where Cortez and all his men might have encamped in a single building. Another site discovered by Charnay, and temporarily named Lorillard City, after the patron of his explorations, is decided to be the remains of Izancanac, the capital of the State of Acallan, traversed by Cortez in returning to Honduras. These, as well as Copan, Chichen Itza, and Izamal are of relatively modern origin, and, according to Charnay, cannot exceed seven or eight hundred years in age.

The explorer decides that the remarkable edifices of Yucatan and Chiapas are wholly due to the Toltecs, immigrants from the plateau of Anahuac, after the destruction of the Government of Tollan in the beginning of the twelfth century. The differences exhibited by the various monuments, to him characterize only stages or special developments of one and the same, state of art and social culture. "However this may be," says Dr. Hamy, the learned and distinguished archæologist of Paris, "the affinities demonstrated by Charnay between Yucatan and ancient Anahuac, are so close, so very numerous, and so much in harmony with the teachings of history that it will be indispensable hereafter that they shall be seriously taken into account in the study of American ethnology."

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